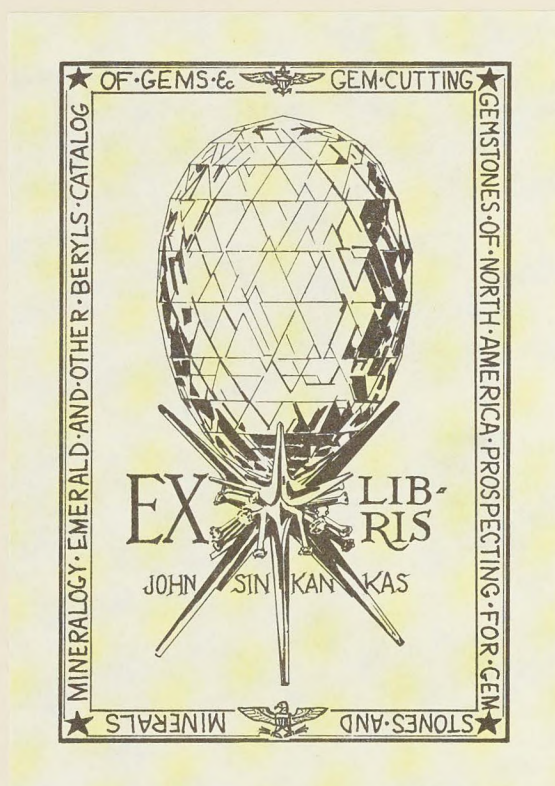




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Cat Walford

1/75 Bow Windows @ 880<sup>00</sup> /  
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12183 L.A. \$1.650<sup>00</sup>

The Rashleigh Collection was bought by public subscription for  
£1,200 and donated to the Cornwall Co. Museum, Truro, Cornwall  
where it still is.





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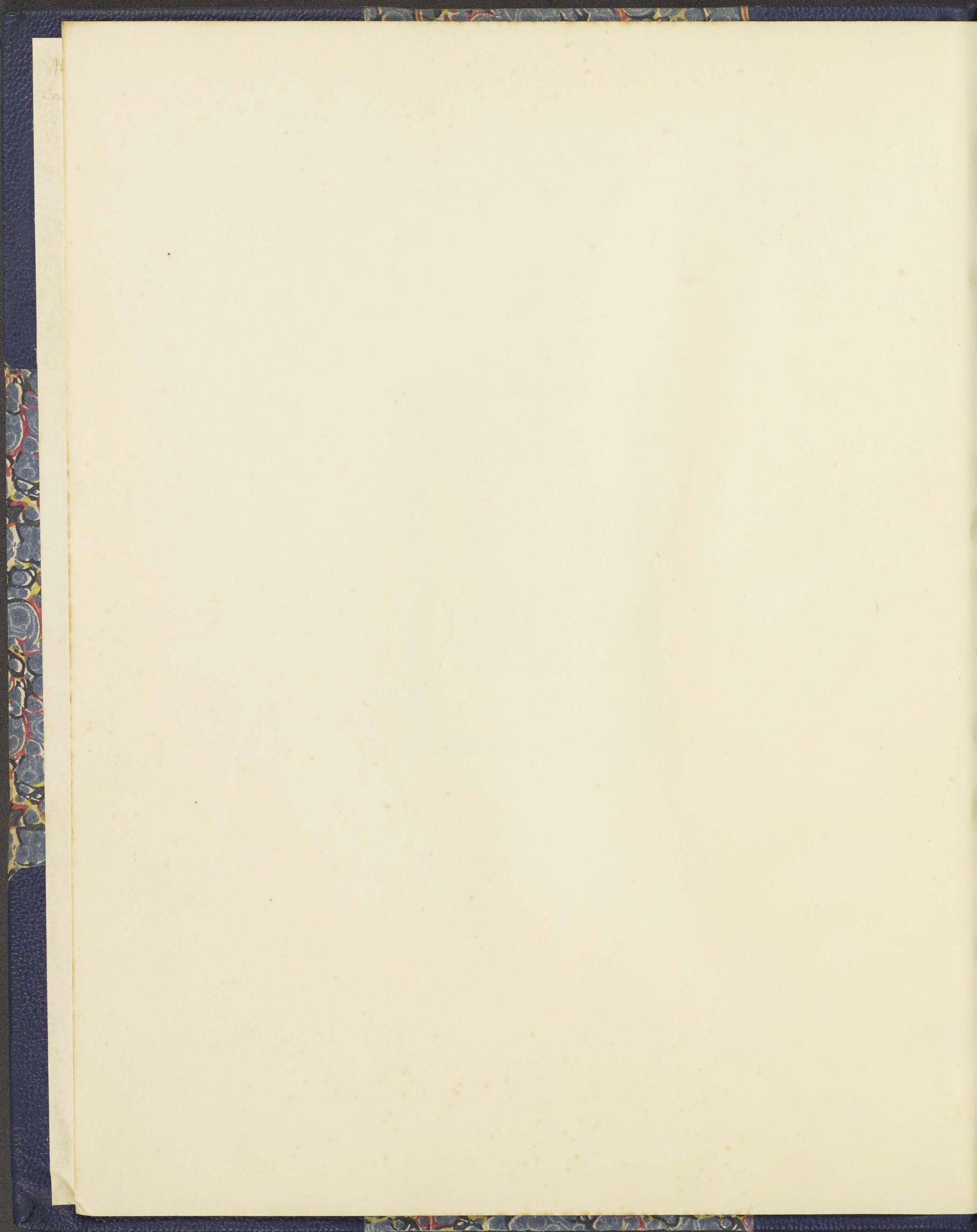
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SPECIMENS  
OF  
BRITISH MINERALS,  
SELECTED FROM  
THE CABINET  
OF  
PHILIP RASHLEIGH,  
OF MENABILLY, IN THE COUNTY OF CORNWALL, ESQ. M.P.  
F.R.S. AND F.A.S.  
WITH  
GENERAL DESCRIPTIONS OF EACH  
ARTICLE.

LONDON:

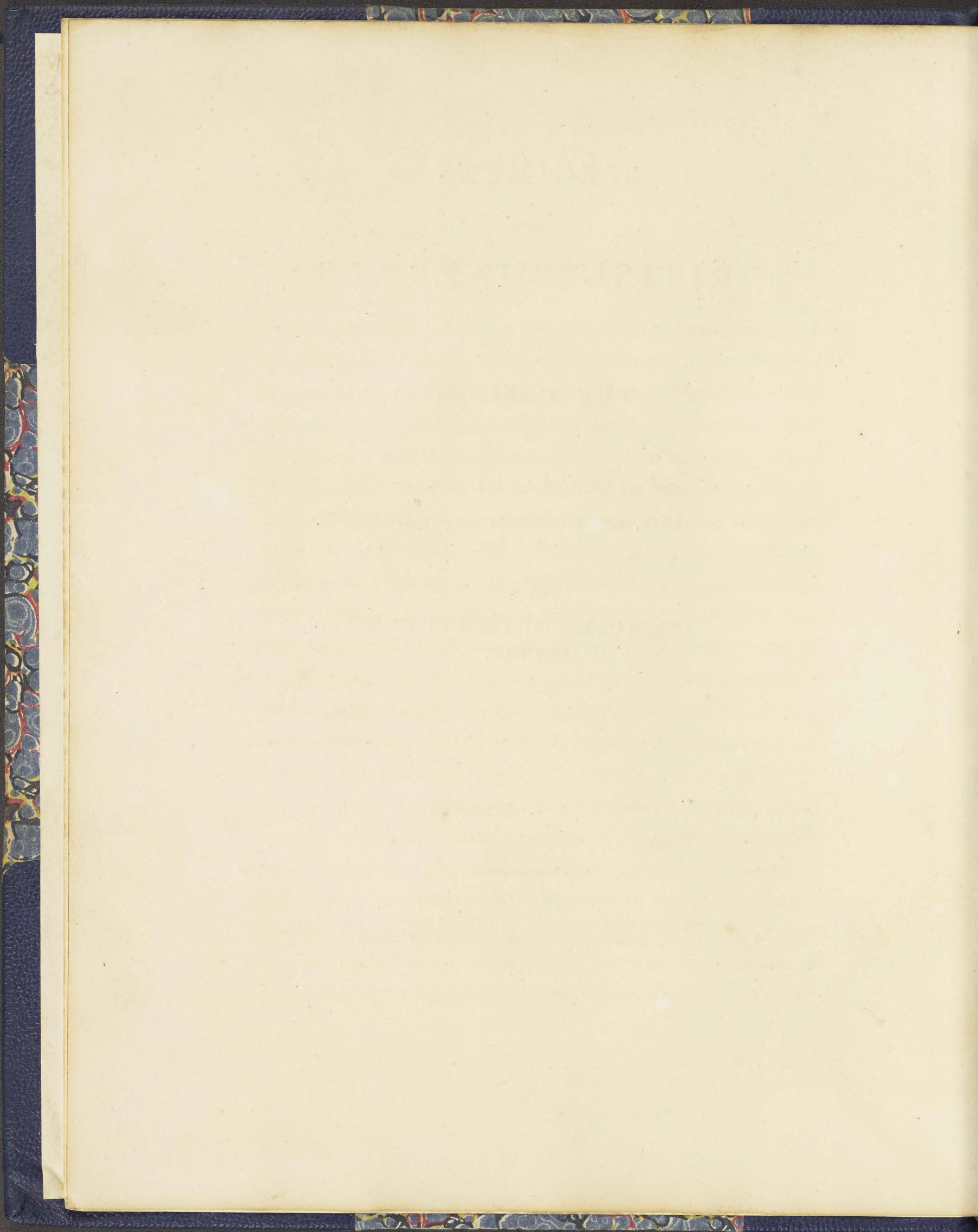
PRINTED BY W. BULMER AND CO.

AND SOLD BY G. NICOL, BOOKSELLER TO HIS MAJESTY, PALL-MALL,  
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1797.

1797-1802







## INTRODUCTION.

THE Specimens exhibited in the following Prints have been selected from a large Collection of Minerals, to shew the varieties of British Fossils, which differ so much from those of other nations as scarcely to be known by the best mineralogists. The external view of metallic ores can seldom give an accurate knowledge of their contents, but will frequently lead to suggestions that may facilitate and shorten the process of chemical experiments. The study of Mineralogy being at this time pursued with great ardour by men of the first ability, every thing which tends to aid their experiments, by lessening their labour, will leave them more time to promote the advancement of useful knowledge.

The Collection from whence these Specimens are taken, belonging to a private gentleman who lives in a remote part of the kingdom, is from that circumstance seen by few, though never refused to any who are properly made known, or who are recommended by their scientific abilities.

Several years attention to this Collection, and great assistance from friends in procuring the varieties of British Minerals, particularly from gentlemen who are most interested in the mines of Cornwall, have rendered this Collection very extensive, and to experienced Mineralogists very interesting.



#### INTRODUCTION.

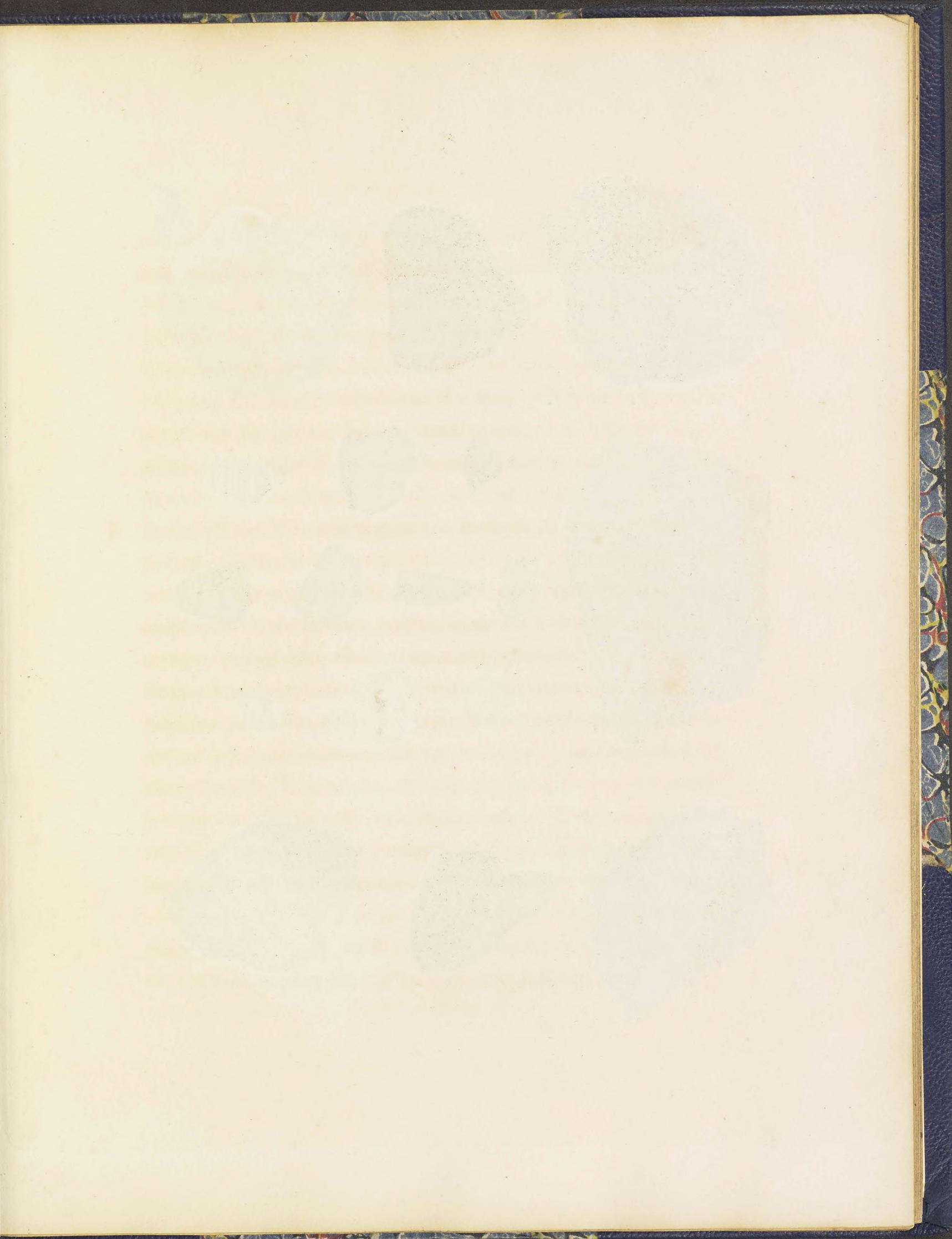
There is great difficulty in representing Minerals on paper, and very few artists are to be met with who have any practice or experience in this line; it will therefore not be very extraordinary if these representations should not give the satisfaction expected; though nothing has been omitted that might tend to promote that object.

If this Publication contributes either to use or pleasure, the end of it will be fully answered.

The Plates with figured tin and copper ores exhibit in one view many of the crystallizations which those metals produce in their natural state. The figures are in some instances shewn more regular and perfect than they have been actually formed in the matrix from which they spring, or in which they are imbedded. Interruptions to their perfect shape being frequently occasioned either by the matrix itself, or by other crystallizations shooting across them.

The Reader will be so good as to observe, that where the county from which any particular specimen has been derived is not mentioned, the fossils are from the county of Cornwall.











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## PLATE I.

PLATE the first is wood-like tin ore. This sort of ore is never found in large quantities: small and distinct fragments are frequently met with in stream works in various parts of *Cornwall*, particularly about *St. Austell*, *Roach*, *St. Dennis*, *Luxullian*, and the adjacent places, and lately in the parish of *Sithney*.

Wood tin ore is a term well known to most of the tanners employed in the stream works, from its fibrous or radiated texture, resembling the colour and appearance of wood cut from a knotted tree; it is likewise called by some tooth tin, from its tooth-like shape. Many of the specimens so nearly resemble hæmatite iron ore, as to be scarcely distinguishable therefrom by inspection, though easily discovered by the weight, or by being scratched with a steel instrument, which produces a white powder, while the hæmatite iron ore produces a red powder.

This wood-like tin ore is a very hard substance, as appears from the number of small fragments found in stream works, with sharp angles, though sometimes, and but seldom, in a



round pebble-like form. It seems extraordinary that many small pieces of this ore should be found in different stream works, but very seldom united in a mass ; and yet they have the appearance of having been broken from large pieces, and from their sharp angles to be natives of the adjoining ground ; but even with very diligent inquiry and search, large pieces are seldom to be procured.

The several representations in this Plate will tend to show most of the varieties of this sort of ore.

*Fig. 1.*—Is a large mass of accumulated crystallizations of wood-like tin ore, formed in segments of concentric circles, having variegated belts of different shades of brown, from very dark to very light ; of a striated texture, in a solid stone of rich tin ore : it contains  $63\frac{1}{3}$  of tin in 100 of ore, according to Mr. Klaproth. This assay seems very exact, from other trials. This stone weighs 5 oz. 1 dr. and was found in the higher quarter of *St. Austell*.

*Fig. 2.*—Is a large piece of tin ore, with the common wood-like tin ore in the middle part of the stone, composed of many striated crystallizations, diverging from different centres, and meeting at their circumferences near the middle line of the stone ; the upper and lower parts of the specimen are more solid tin ore. This stone appears to be broken from a similar piece, if not from a lode. It is a



rich tin ore, and weighs 11 oz. 11 dr. and was found in *Goss Moor*.

*Fig. 3.*—Is a mass of different globular figures of wood-like tin ore, exhibiting a great variety of portions of circles, each shooting from its own centre; the whole a brown colour, the interior part more light than the exterior, which is nearly black. A little quartz is mixed with this specimen, particularly on the reverse of the specimen here exhibited, on which small crystals of quartz pyramids are covered with wood-like tin ore; from whence it should seem that the tin ore was formed subsequent to the crystals of quartz. This stone is very rich in tin, and weighs 8 oz.; it came from *Gaverigan*, in the parish of *St. Colum*.

*Fig. 4.*—Is dark brown wood-like tin ore, of a very solid texture, having different circles of light brown belts or veins, with hollow impressions on the other side, as if it had been formed on smooth convex figures. It weighs 1 oz.  $5\frac{1}{2}$  dr.

*Fig. 5.*—Is nearly of a similar substance with *fig. 4.* but with black belts or veins, running in circular lines. Weight 2 oz. 11 dr.

*Fig. 6.*—Is very compact wood-like tin ore, shooting from hollow centres, in oval or circular forms, and veins running from the centre to the circumference, with various

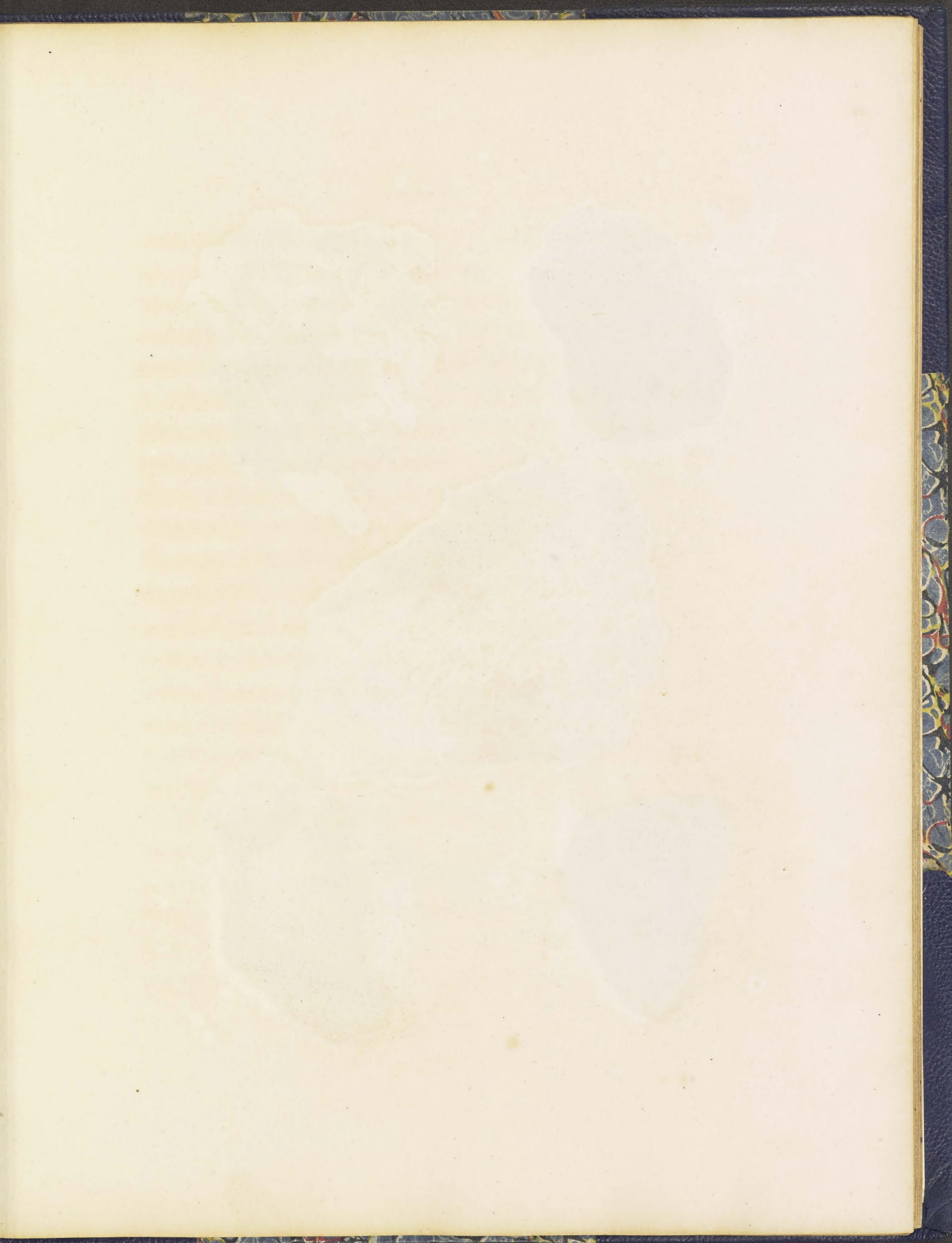


shades of brown. This is nearly as solid as agate. It weighs 3 oz. 3 dr.

*Fig. 7.*—Is wood-like tin ore, resembling pins' heads, consisting of small circles in a stone of quartz, with a little black needle cockle or shorl: the circles are in general a little hollow in the centre, but round where not interrupted in the forming; they are spotted in every part of the stone. This is a very dry ore (a term the tinnerns give to a sort that produces little metal) found in the higher quarter of *St. Austell*. *a* The ore a little magnified.

*Fig. 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17.*—Are several other varieties of stream tin ore, which are called wood tin or tooth tin ore; these vary in colour, but are all formed in concentric circles. No. 8. and 11. are particularly called tooth tin, from their form. Some resemble the knots, others the regular concentric veins of wood, and are of a glossy appearance, such as No. 12. and 13.











## PLATE II.

*Fig. 1.*—Is a stone of light brown tin ore between hard black waved veins of elvan running between the tin ore, which is mixed with quartz. The tin ore is so much softer than the elvan as to have given way to the action of water and friction against harder substances, and to have left the black veins projecting a little beyond the tin ore. All the angles of this stone have been worn off in its course from the lode to the stream work at *Porth*, in the parish of *St. Blazie*, where it was found.

*Fig. 2.*—Is a very rich stone of tin ore, of nearly the same contents as *fig. 1*. The tin lies between two walls of black elvan. The same black elvan runs in nearly parallel lines through the stone, but is broken into spots and mixed with tin ore, instead of lying in continued veins as in the walls or sides. This stone is very rich in tin, and is likewise of a pebble form, and found in *Saundrycock*, in the parish of *St. Blazie*.

*Fig. 3.*—Is a pebble of grey-coloured tin ore, with a number of stones cemented together like the common plum-pudding stones, found in *Carnan water* stream work, in the parish of *Perran Arworthall*.



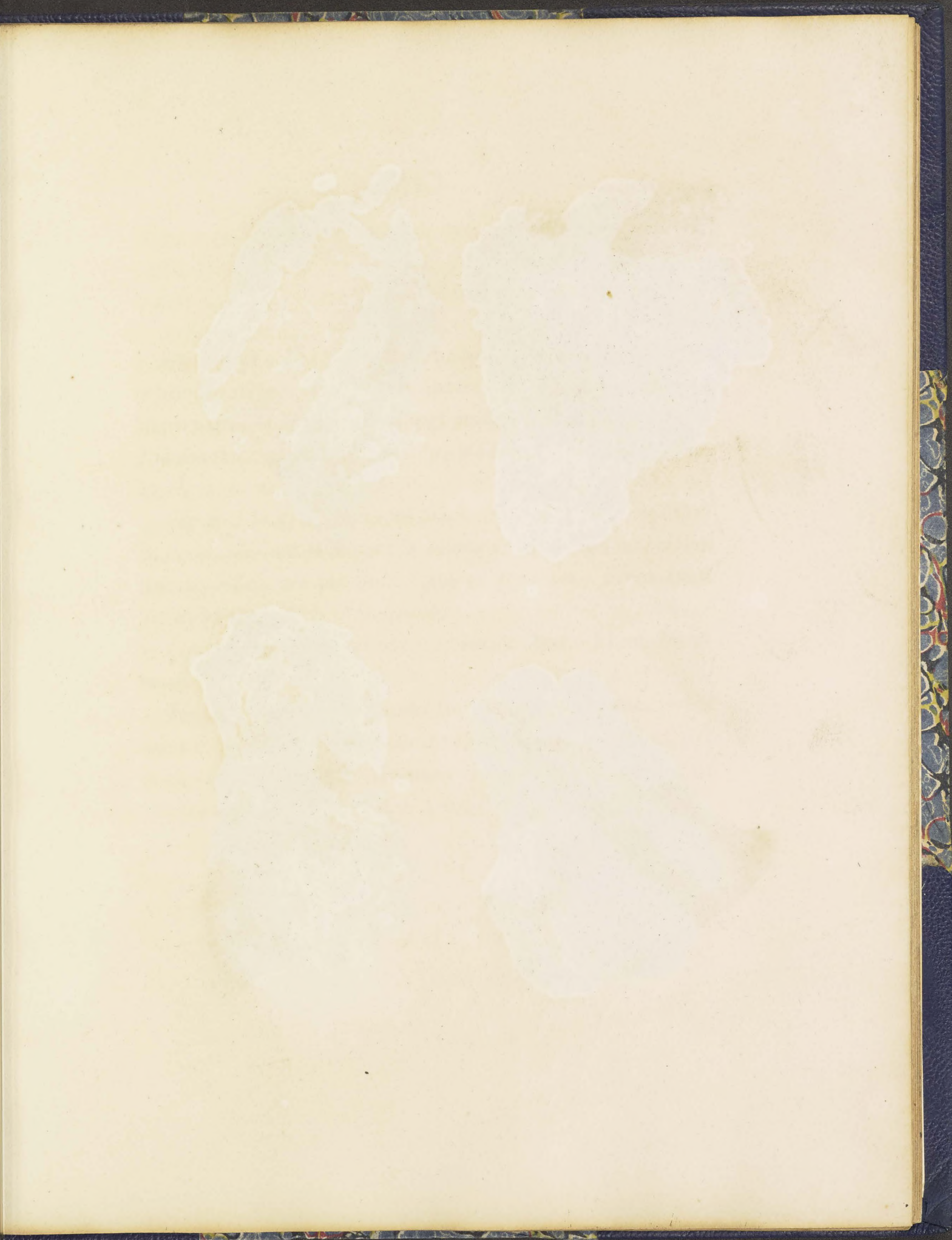
*Fig. 4.*—Is tin ore accumulated with a mass of other small stones, mixed between angular veins of quartz and elvan, in alternate stripes on one part of the stone. It was found in *Porth* stream work.

The tin ore in the above four specimens is a dull brown colour, and opake.

*Fig. 5.*—Black veins of tin ore, between light-coloured shistus or slate mixed with a little mica; from the *Pell mine*, in *St. Agnes*.

The black elvan in *fig. 1.* and the black tin ore in *fig. 5.*, have nearly the same appearance to those who are not accustomed to view such stones.











## PLATE III.

*Fig. 1.*—This is a stone composed of different strata. *a* is brown tin ore, mixed with quartz. *b* is black hard argillaceous iron ore. *c* is shining glimmer, mixed with quartz. *d* is the same as *b*, but mixed with quartz; from *Dartmoor* in *Devonshire*.

*Fig. 2.*—Is a rich stone of black shining tin ore, spotted in flesh-coloured feldspar; a substance that seldom carries tin ore. The ore produces  $\frac{13}{20}$ ths of pure tin. From *Huel Jewel*, in the parish of *Gwennap*.

*Fig. 3.*—Reddish brown tin ore in flint. From *Dartmoor*.

*Fig. 4.*—Is reddish brown tin ore as at *a*, mixed with mica in a vein between chlorite *b*, or greenish peach mixed with mica, and a vein of quartz *c*. From *Carvath mine*, in the parish of *St. Austell*, and county of *Cornwall*.



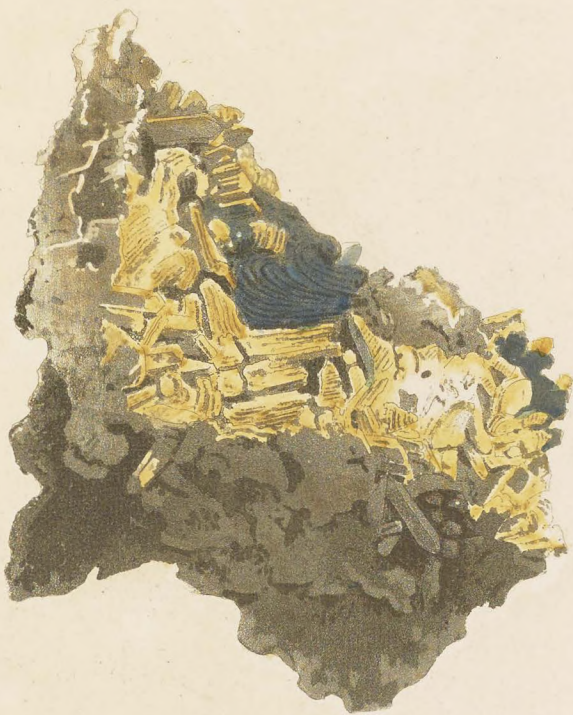
## PLATE IV.

*Fig. 1.*—Is a very rich piece of tin ore, the whole composed of very small perfect crystals of semi-transparent brown tin ore, intermixed with a small quantity of peach or chlorite. From *Glassteining mine* near *St. Austell*, the working of which mine has been stopped, as not answering the expence.

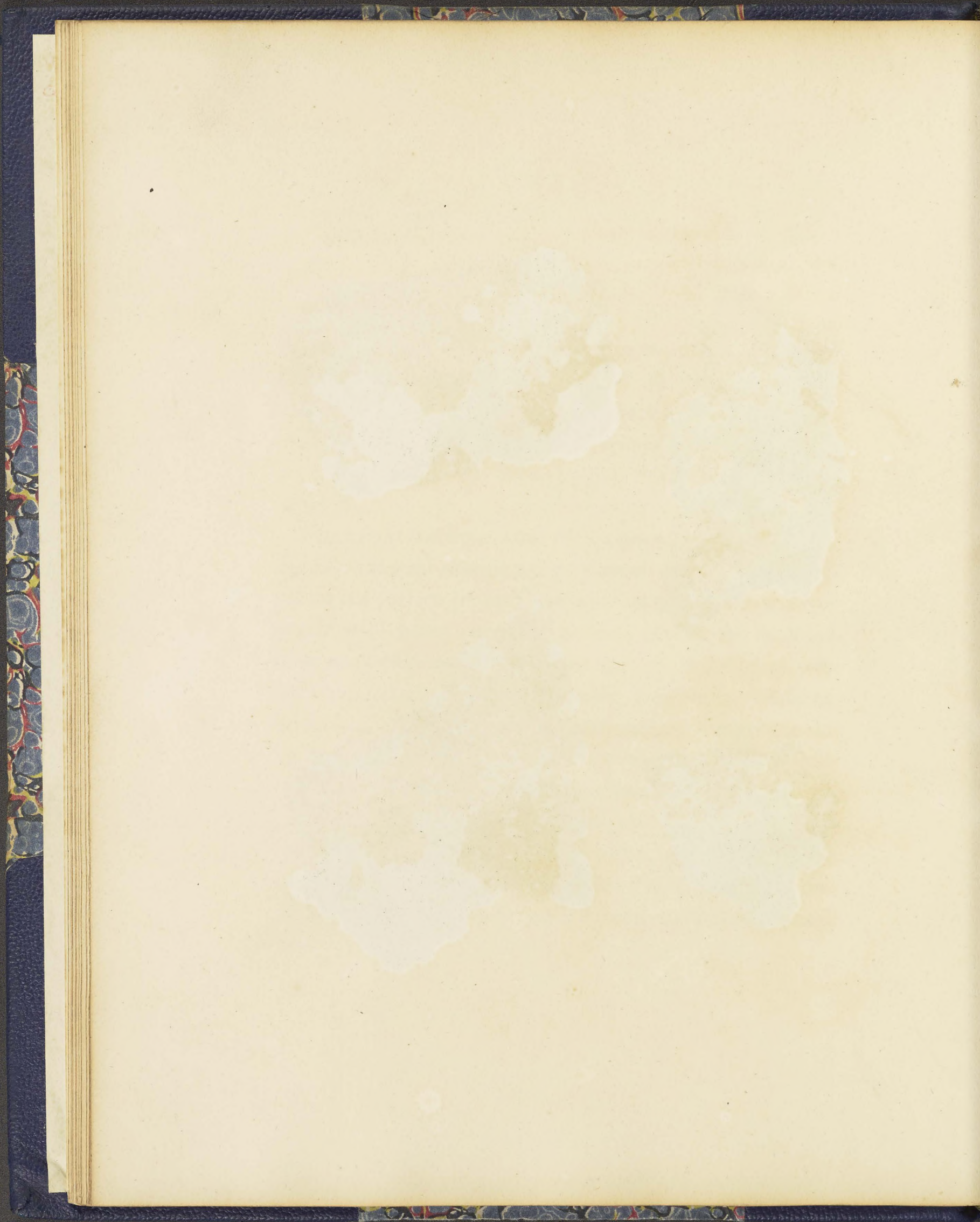
*Fig. 2* —Is the same kind of tin ore as *fig. 1*, but much mixed with semi-transparent crystals of quartz, which are cut on the surface in such a manner as gives them the appearance of being composed of thin plates: the cause of these marks has not yet been determined; as they are made both transversely and longitudinally, they are not likely to be occasioned by any mineral acid passing over them, as by such a menstruum they would probably be affected all in the same direction. From *Glassteining mine*.

*Fig. 3.* Black opake shining crystals of tin ore, with bunches of spear-pointed white mundic, imbedded in green peach or chlorite upon killas. From *Trevascus mine* in the parish of *Gwinear*, which has not been worked for several years.











*Fig. 4. Tin ore in quartz, with crystals of tin ore on one side, covered with greenish white mica, peach, or chlorite, with a crystal of twenty-four-sided fluor. From Huel Kine, in St. Agnes.*



## PLATE V.

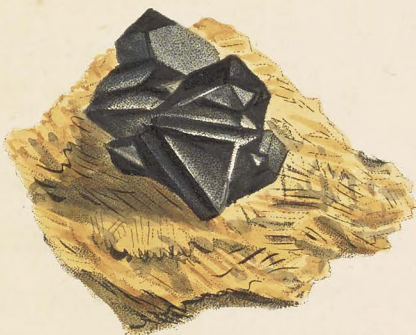
*Fig. 1.*—This represents a group of the largest tin crystals, consisting of four-sided columns, with a pyramid of eight sides, by the angles of the regular four-sided pyramid being truncated so much as to exceed the breadth of the original sides of the regular figure. These crystals of tin ore are of a fine shining black colour, and are set in chlorite or peach, of a perfect white colour, round the edges of the black tin ore; the outside coat of this chlorite or peach is of a dark green. The stone is very rich in tin ore, with some fluor and quartz intermixed. From the *Pell mine*, in *St. Agnes* in *Cornwall*.

*Fig. 2.*—Represents a large, black, shining, tin crystal, with a very short column and broad pyramid, which is interrupted by other crystals forming thereon. This tin ore is formed in a group of small crystals of yellow topazes. This is a singular specimen, and came from *Trevaunance*, in *St. Agnes*.

*Fig. 3.*—Is the figure of an extraordinary large crystal of tin ore, with the sides of the pyramid very broad, and the end of it truncated: it is of a brown colour, and in rich tin ore with quartz. From *St. Agnes*.



2



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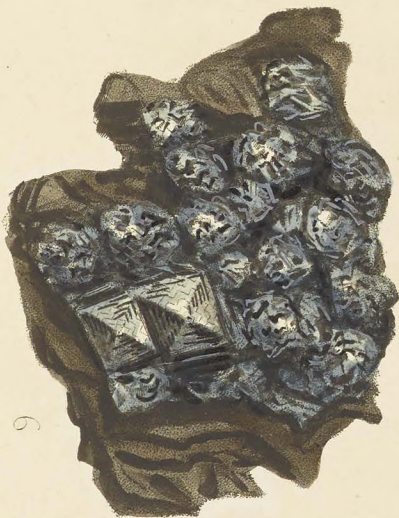
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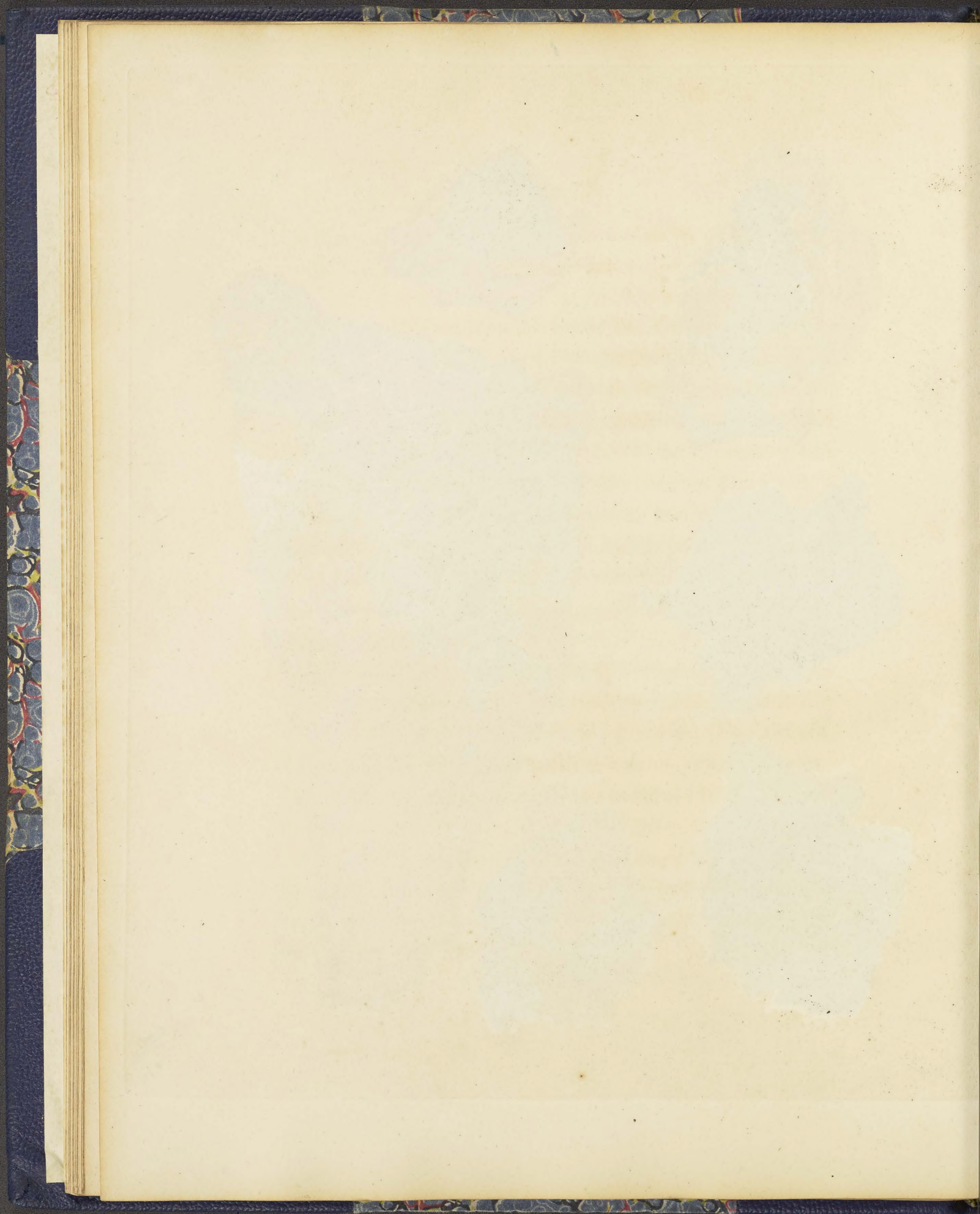
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*Fig. 4.*—Represents a stone of very rich tin ore, with tin crystals covered with globular, black, shining iron ore, some of the tin crystals perfect, and appearing where the iron ore has been broken off, shows that the crystals of tin ore were completely formed, before the iron ore was spread over the tin ore. All the crystals are formed in the hollow part of a stone of quartz, which is partly stellated. From *Huel Prosper*, in *St. Agnes*.

*Fig. 5.*—Represents small crystals of semi-transparent tin ore, intermixed with transparent crystals of six-sided quartz, and green chlorite or peach. The crystals of quartz in this specimen are not covered with the opake yellow, as in *Pl. iv. fig. 2*, but they have marks indented on the quartz, which appear to have been made by tin crystals having formed upon the quartz before it was perfectly consolidated, and which have afterwards fallen off. From *Glassteining mine*, in *St. Merwan* parish.

*Fig. 6.* Represents the quilted tin ore, which consists of black shining crystals of tin ore, with prisms of four sides, and the ends burst into innumerable small four-sided pyramids, like a seal for wafers; from which the miners give it the name of quilted tin ore. From *Trevaunance mine*, in *St. Agnes* parish.



## PLATE VI.

*Fig. 1.*—Is copper ore, with a thin coat of blue purple colour over yellow copper ore, upon which are formed small crystals of copper ore, with prisms of six sides, and truncated ends of a bright steel colour, lying flat on the mammillary or stalactical ore: *a* is one of the steel-coloured crystals of copper ore, a little magnified. From *Cook's Kitchen*.

*Fig. 2.*—Is yellow copper ore, of a mammillary or stalactical form, with a thin coat of a red purple colour, upon which are formed crystals of grey copper ore, about  $\frac{1}{4}$ th of an inch long, having a prism of six sides, and truncated ends, shooting from centres in star-like forms. *b* One of the crystals magnified. From *Cook's Kitchen*, in *Illogan* parish.

*Fig. 3.*—Is copper ore in long thin laminated bunches, with little globular figures upon the ends, and small flat eight-sided crystals of grey copper ore, interspersed about the whole specimen, which is of a green pigeon-neck colour. All the above grey crystals are upon copper ore mixed with quartz. From *Cook's Kitchen*.

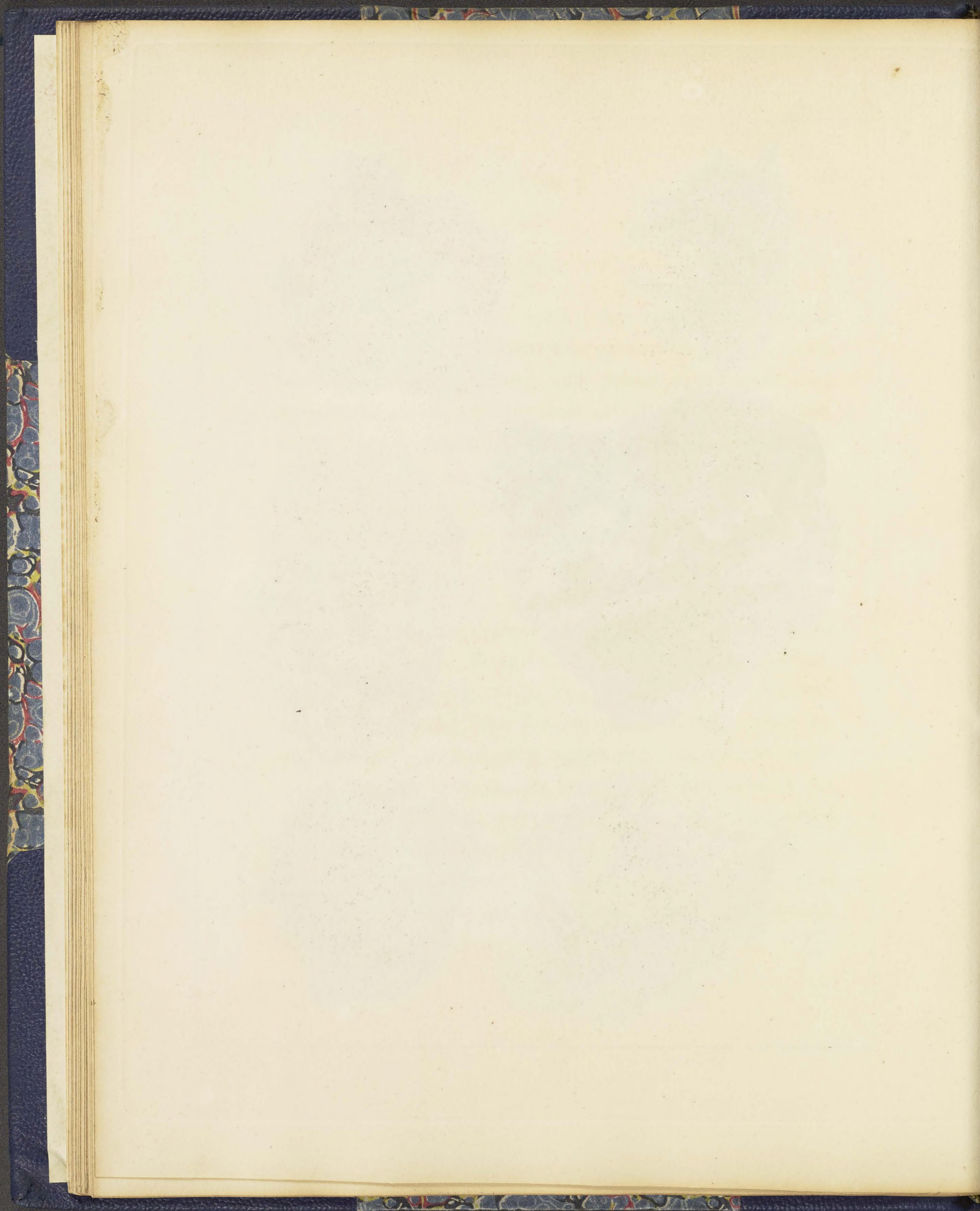
*Fig. 4.*—Is yellow copper ore, with a thin coat of a purple colour, in stalactical cellular forms, upon quartz. From *Cook's Kitchen*.



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*Fig. 5.*—Is crystallized yellow copper ore, like bits of brass wire on the surface of a stone of copper ore, with a vein of quartz dividing the stone. From the *Pool mine*, in *Illogan* parish.

*Fig. 6.*—Represents large crystals of bright yellow triangular copper ore, with black crystals of blend, having the angles truncated as *c*, and six-sided crystals of transparent quartz. From the *Pell Adit*, in *St. Agnes*.



## PLATE VII.

*Fig. 1.*—Is yellow copper ore of various shades, from yellow to red, crystallized in a singular form, viz.: a flat four-sided figure, composed of a plane, with four straight lines meeting in four angles on one side, about an inch in length, and  $\frac{5}{8}$ th of an inch broad, as at *a*; the opposite side is nearly the same length and breadth, with a cuneated figure rising out of the middle, as at *d*, one of the sides is represented at *b*; the top is bevilled off to very near the edge, which is truncated, and nearly at right angles with the broad flat side, as at *c*. The specimen is studded over with black shining crystals of blend; with crystals of quartz and fluor interspersed, and tin ore in some part of the stone. From *Cuanhaven*, in *St. Agnes*.

*Fig. 2.*—Is a piece of stalactical or nettled yellow copper ore, like wire. From *Cook's Kitchen*.

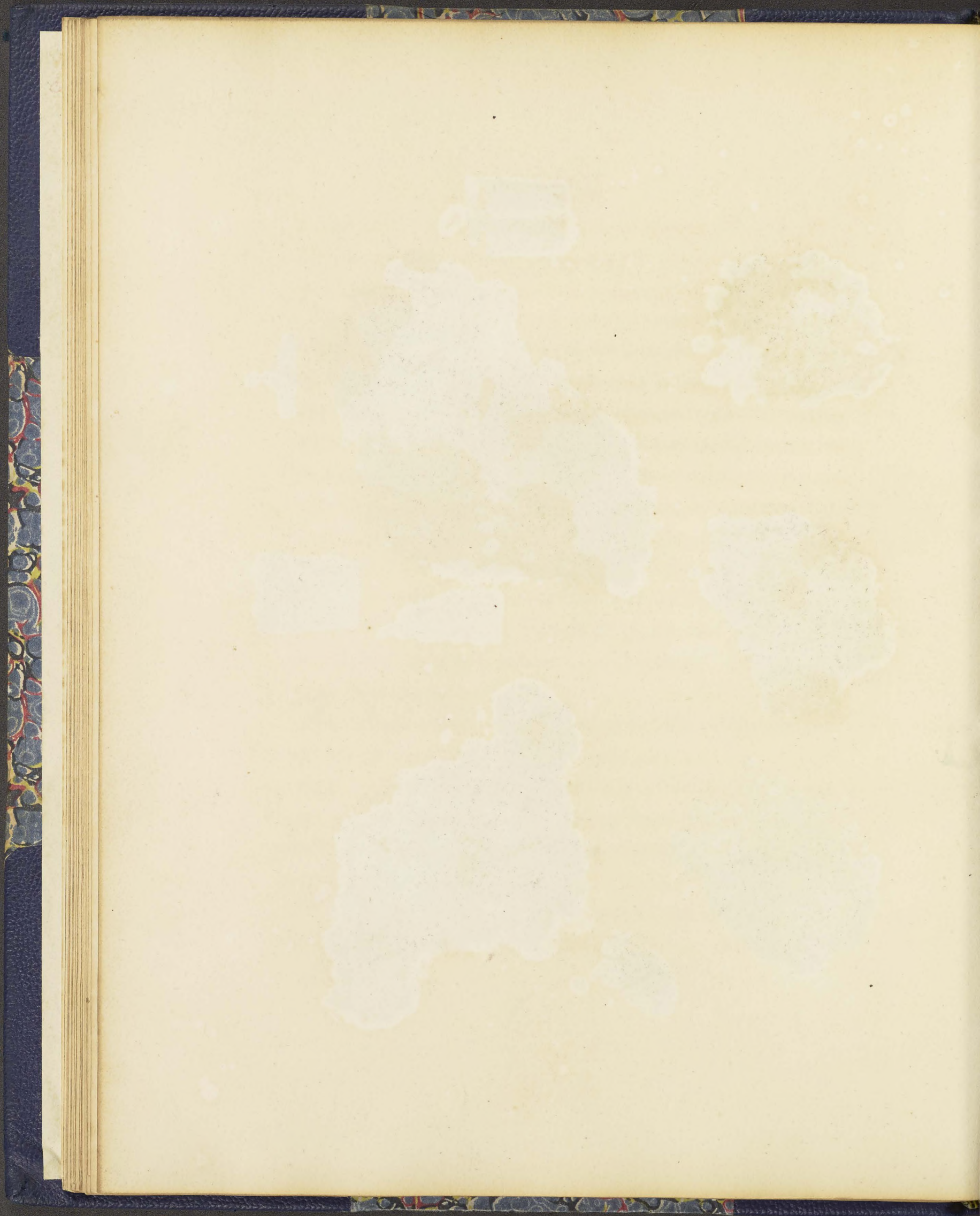
*Fig. 3.*—Is yellow copper ore, with rhomboidal crystals tending to parallelograms, coated as thin as possible with black blend, and intermixed with transparent crystals of quartz.

*Fig. 4.*—Is crystallized yellow copper ore, like tarnished silver, coated with blend, as *fig. 3*.











*Fig. 5.*—Represents large plated six-sided crystals of grey copper ore, one over the other, with small prisms of grey copper ore, having six sides, and truncated ends upon some of the plated crystals ; upon a stone of loose quartz. From *Cook's Kitchen*.

*Fig. 6.*—Is a most delicate piece of green malachite, the surface is so very tender as to be destroyed by the least touch : under the upper green coat are various onion-like skins, varying in colour, from a fine green to a perfect white ; with a little sand stone at the under part. From *Llandidno, in Denbig<sup>h</sup>shire*.



## PLATE VIII.

*Fig. 1.*—This is a singular piece of copper ore, with circular forms, and minute rays of a brown colour, issuing from central points; from the rim of this circle spring larger rays of a green colour: the inward part of a brown colour, is much like wood tin ore; all of which is formed in a stone of quartz tinged with reddish ochre and copper ore. This contains a great portion of arsenic. From *Tincroft*, in the parish of *Illogan*.

*Fig. 2.*—Is composed of globular figures, with fine rays diverging from central points of a brown colour, like *fig. 1.* where broken; but instead of the green rays springing from the rim of the brown radiated figures, they are covered with smooth green copper ore, like malachites, and minerallized with arsenic. From the same mine.

*Fig. 3.*—Is yellow copper ore, in flint, and opal of a milk white colour, gradually depositing the opake white, until it becomes pure flint. A little peach or chlorite is mixed in some part of the stone. It was found in *Reskear mine*, near *Huel Rosewarne*, in the parish of *Camborn*.

*Fig. 4.*—Is mammillary copper ore, of a fine green colour, with rays diverging from centres, nearly covered with black





4



1



3



2



5







shining iron ore, which seems to be decomposing the copper ore, the green colour appearing in all parts where the fractures are made. From *Huel Husband*, in the parish of *St. Ewe*.

*Fig. 5.*—Is red copper ore, called tile ore, formed in blisters, like cinders, which are broke in some places, and the copper nearly decomposed and converted into copper ochre, with some red crystallized copper ore, covered with malachites. From *Tincroft*, in the parish of *Illogan*.



## PLATE IX.

*Fig. 1.*—Is yellow blistered copper ore, with a thin coat of a purple colour intermixed with a little quartz, and partly covered with small semi-transparent crystals of a rhomboidal form, and brown colour. *a* One of the brown crystals magnified. From *Cook's Kitchen*.

*Fig. 2.*—Is green copper ore, with hexangular semi-transparent plates of copper ore minerallized by the marine acid, in a stone of copper ore intermixed with white mundic and quartz. *b* One of the crystals magnified. From *Tincroft*.

*Fig. 3.*—Is copper ore of a dull olive-green colour, with oval serrated crystals of copper ore, minerallized with arsenic. *c* One of the crystals magnified. From *Tincroft*.

*Fig. 4.*—Is yellow mammillary copper ore, covered with a thin coat of a bluish-green colour, with crystals of steel-coloured copper ore, composed of prisms having six sides, and truncated ends, formed upon the mammillary copper ore. *d* One of the steel-coloured crystals magnified. From *Tincroft*.

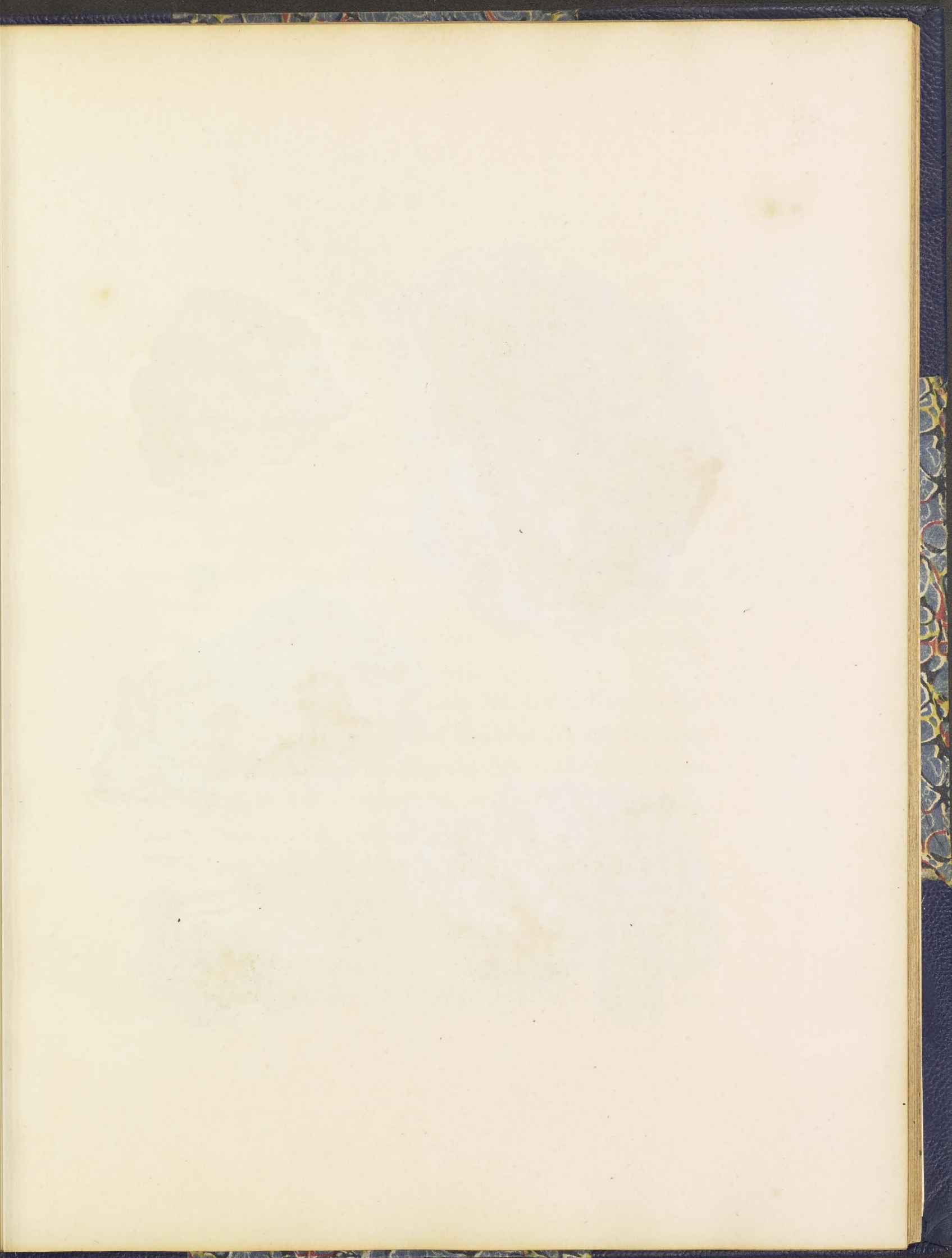


















## PLATE X.

*Fig. 1.*—Is yellow copper ore in quartz, with hard, black, native mineral pitch. From *Carharrack*, in *Gwennap* parish.

*Fig. 2.*—Is dark green and blue copper ore, in star-like figures, upon quartz tinged with ochre; the copper ore mineralized by the acid of arsenic. From *Carharrack*.

*Fig. 3.*—Represents transparent crystals of olive-green arsenical copper ore, with flat prisms and spear points in the hollow part of a stone of quartz, mixed with grey copper ore, and some red spots of ochre. *a* One of the crystals a little magnified. From *Carharrack*.

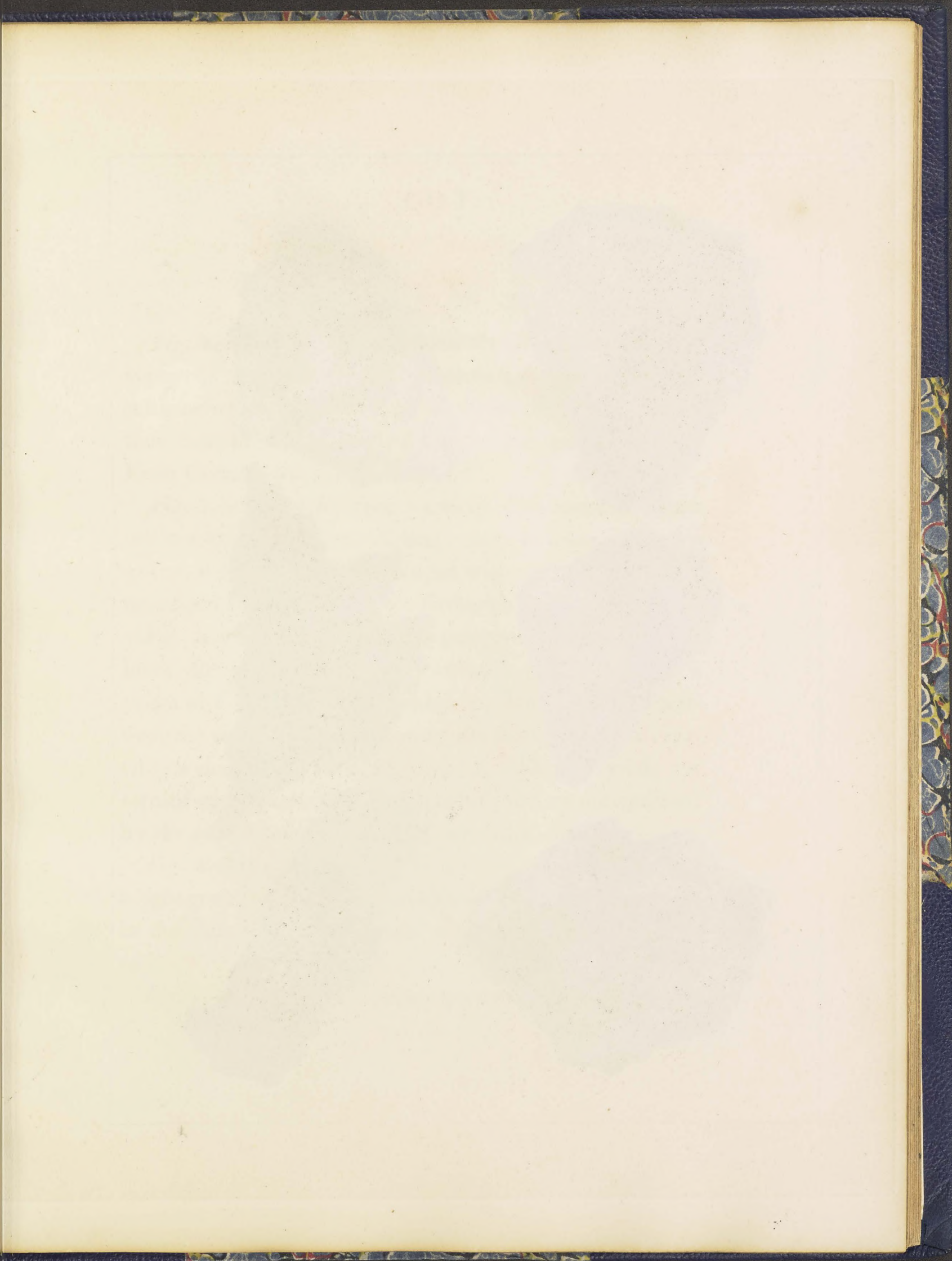
*Fig. 4.*—Green and blue copper ore, crystallized in the hollow part of a stone of quartz; the blue crystals forming rectangular plates, with the edges bevilled: the green crystals forming irregular thin plates, with the edges jagged; some of the quartz is stellated, and the stone tinged with various colours of copper. *a* One of the blue crystals a little magnified. From *Carharrack*.

*Fig. 5.*—Is grey copper ore with blue semi-transparent crystals, with prisms and pyramid ends; but too confused for distinguishing all the angles. These crystals are



soft enough to be cut with a knife ; they will not dissolve in water, or ferment in spirit of nitre ; they yield no arsenical or sulphurous fumes by gentle heat, but turn to a light brown colour: they contain but a very little copper, and came from *Carharrack*.











## PLATE XI

*Fig. 1.*—Represents small bunches of minute crystals of copper ore like moss, of an olive-green colour, a little tinged with ochre from the matrix in which they are formed; they contain copper minerallized by the acid of arsenic. From *Carharrack*.

*Fig. 2.*—Is a pretty compact piece of olive-green copper ore in a striated form, resembling camels' hair brushes, upon quartz, partly stellated and tinged with red ochre, and minerallized by arsenic. From *Carharrack*.

*Fig. 3.*—Is copper ore of a transparent olive-green colour; the crystals from  $\frac{3}{8}$  to  $\frac{1}{2}$  an inch in length, with a prism of four sides, two of which are broad and two narrow, the narrow sides continuing the thickness of the crystal to a sharp edge, as *a*, *Pl. x. fig. 3*. These crystals are formed upon quartz tinged with ochre, and are minerallized by the acid of arsenic. From *Carharrack*.

*Fig. 4.*—Is the same kind of ore in a stellated form, of a light green colour, the crystals having sharp needle points in the hollow part of a stone of quartz. From *Carharrack*.

*Fig. 5.*—Represents capillary crystals of azure blue cop-

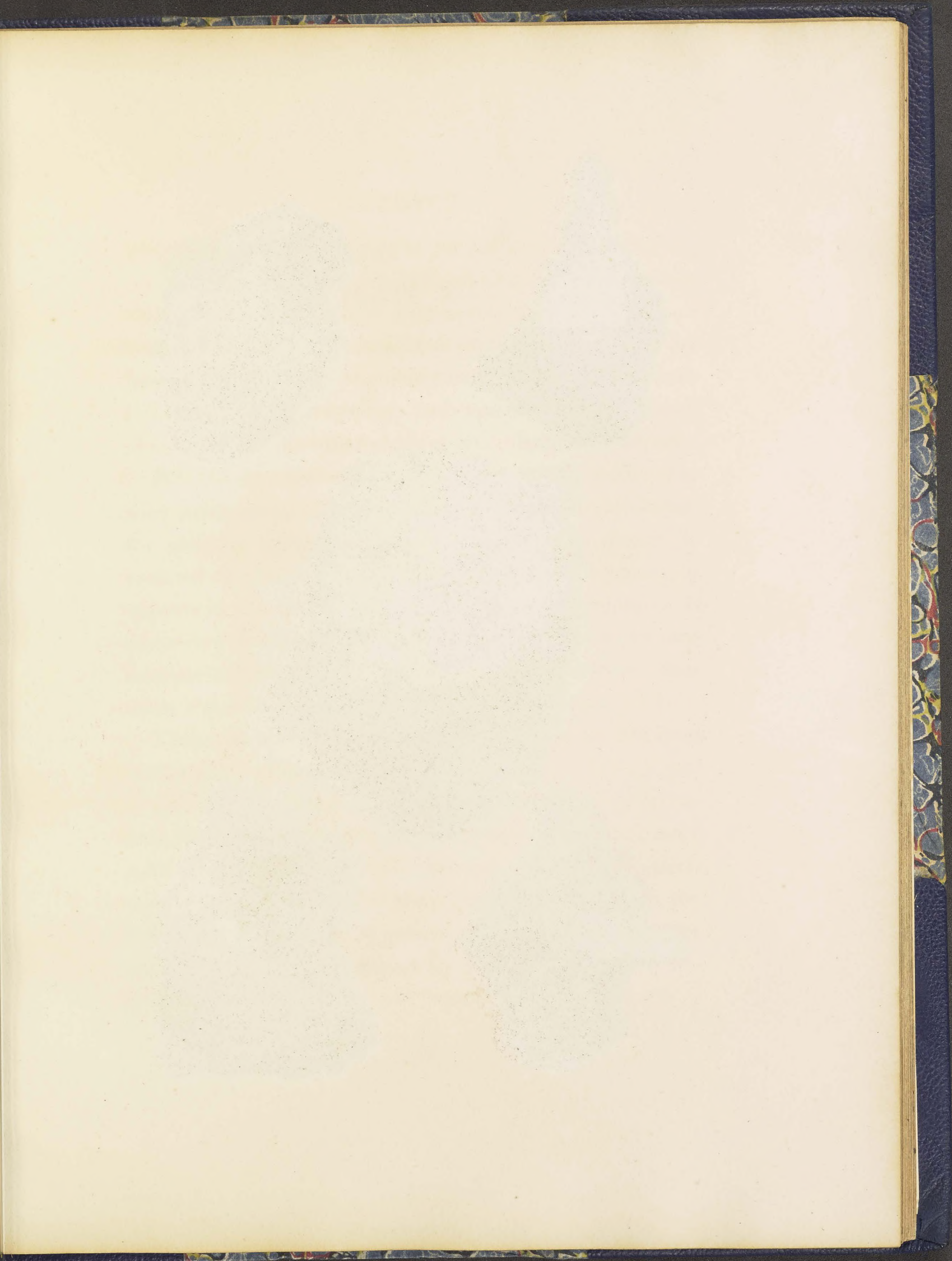


per ore, with dark brown velvet-like ochre. A singular specimen, from *Cook's Kitchen*.\*

*Fig. 6.*—Is grey copper ore coated with a fine purple colour, like polished steel burned; the crystals are composed of prisms with four sides, two of which are broader than the other two, and continue plane to the point of an edge; the two narrow sides are bevilled off to a chisel edge at the end: the crystals cross and intersect each other very much. From *Cook's Kitchen*.

\* For an assay of Carharrack ores, see Klaproth, p. 29 of the English translation.











## PLATE XII.

*Fig. 1.*—Is white satin fibrous copper ore, like a feather issuing out of a stone of quartz; the copper ore is mineralized by the acid of arsenic, and contains nearly one-half of copper, and the other part arsenic. From *Carharrack*.

*Fig. 2.*—Is white satin copper ore, minerallized by arsenic; partly in a kind of honeycomb form, partly globular; the globular figures are formed round reddish quartz, in radiated directions and diverging from central points, as appears in the broken parts of the mammillary forms. It melts very readily by the blow-pipe, and appears to contain one-half fine copper, and the other half arsenic. It is upon a stone of quartz, tinged with copper ochre.

These two specimens of white copper ore are the most rare of any. From *Carharrack*.

*Fig. 3.*—Is striated copper ore of a very pale green colour, almost white, shooting from centres; this is much more solid than *fig. 1.* and *2.* On the upper part of the specimen are minute crystals of olive-green copper ore; in the lower part is a mixture of green, white, and brown copper ore: this is also minerallized by arsenic. From *Carharrack*.



*Fig. 4.*—Represents hollow globules or bubbles of green copper ore like small eggs, in the cavity of a stone of quartz.

*Fig. 5.*—Is light green transparent copper ore in minute crystals, covering a stone of quartz like moss. From *Carharrack*.







Pl. 13





## PLATE XIII.

Is a kind of malachite copper ore, some parts thereof formed like a star, shooting in all directions from a centre, others in small rough irregular branches, with small globular crystals of malachite, interspersed upon friable quartz tinged with ochre, and mixed with red copper ore. This singular specimen was found at *Huel Carpenter*, in the parish of *Gwinear*.



## PLATE XIV.

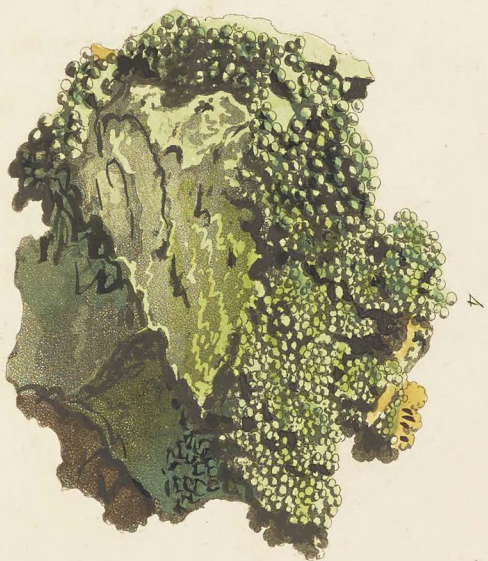
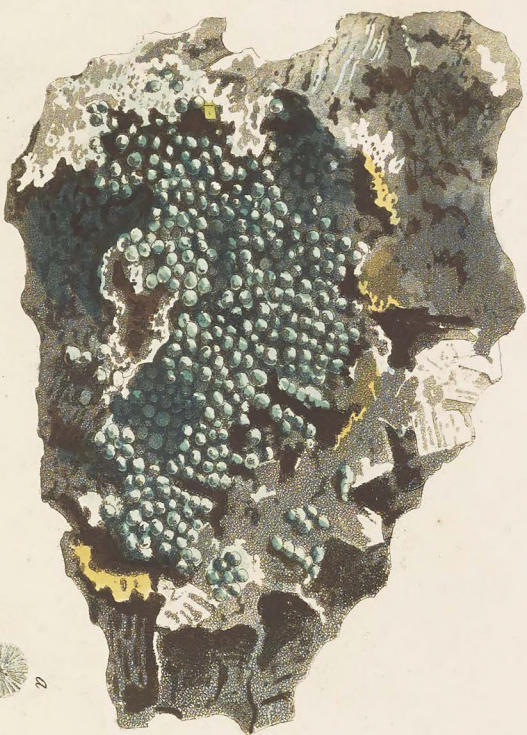
*Fig. 1.*—Represents small mammillary crystals of a light sapphire blue colour, in exceeding fine rays shooting from central points, making the figure appear globular and almost smooth on the surface; the real form is only to be distinguished by a magnifying glass, as represented in the figure *a*. Grey copper ore appears in some parts of this stone, mixed among white quartz. The sapphire blue crystals are very hard and refractory; they contain only a very small portion of copper, a little arsenic, with a great proportion of silex. This singular specimen came from *Carharrack*.

*Fig. 2.*—Thin four-sided crystals of bright green copper ore, with smooth shining surfaces, upon a stone of quartz, tinged with an ochrey rust. From *Carharrack*.

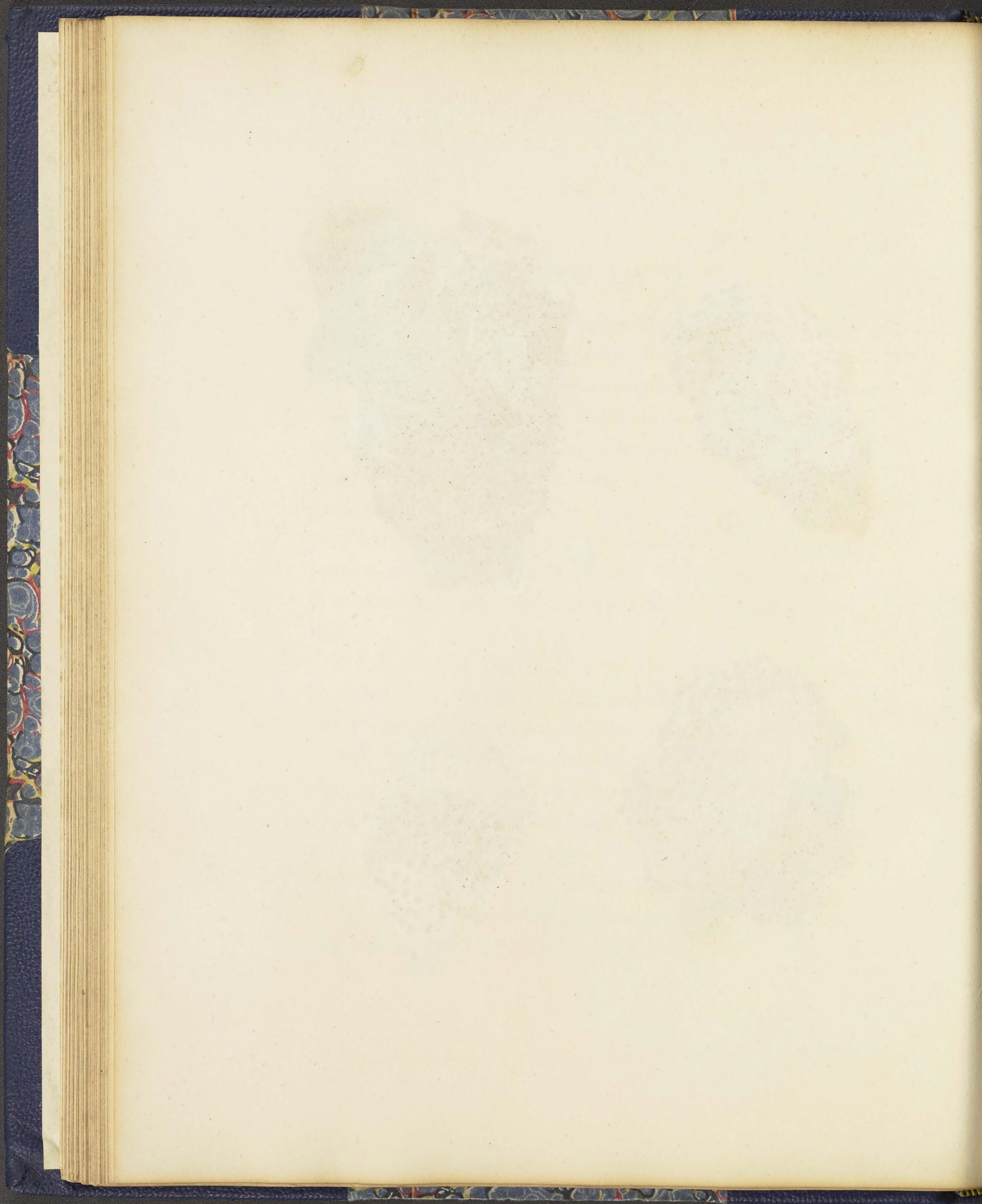
*Fig. 3.*—Is a kind of malachite copper ore in various shapes, some of the crystals in small blisters, others in double four-sided pyramids, one of which is represented at *b*; some irregular and stalactical, upon a red ochrey stone with some red copper ore. From *Huel Carpenter*.

*Fig. 4.*—Represents light olive-green mammillary crystals, containing a very little copper, and a little arsenic: at











the smooth solid part, where the mammillary crystals have been divided, the centres appear to have different shades of green. This stone is very hard, chiefly quartz, and came from *Carharrack*.



## PLATE XV.

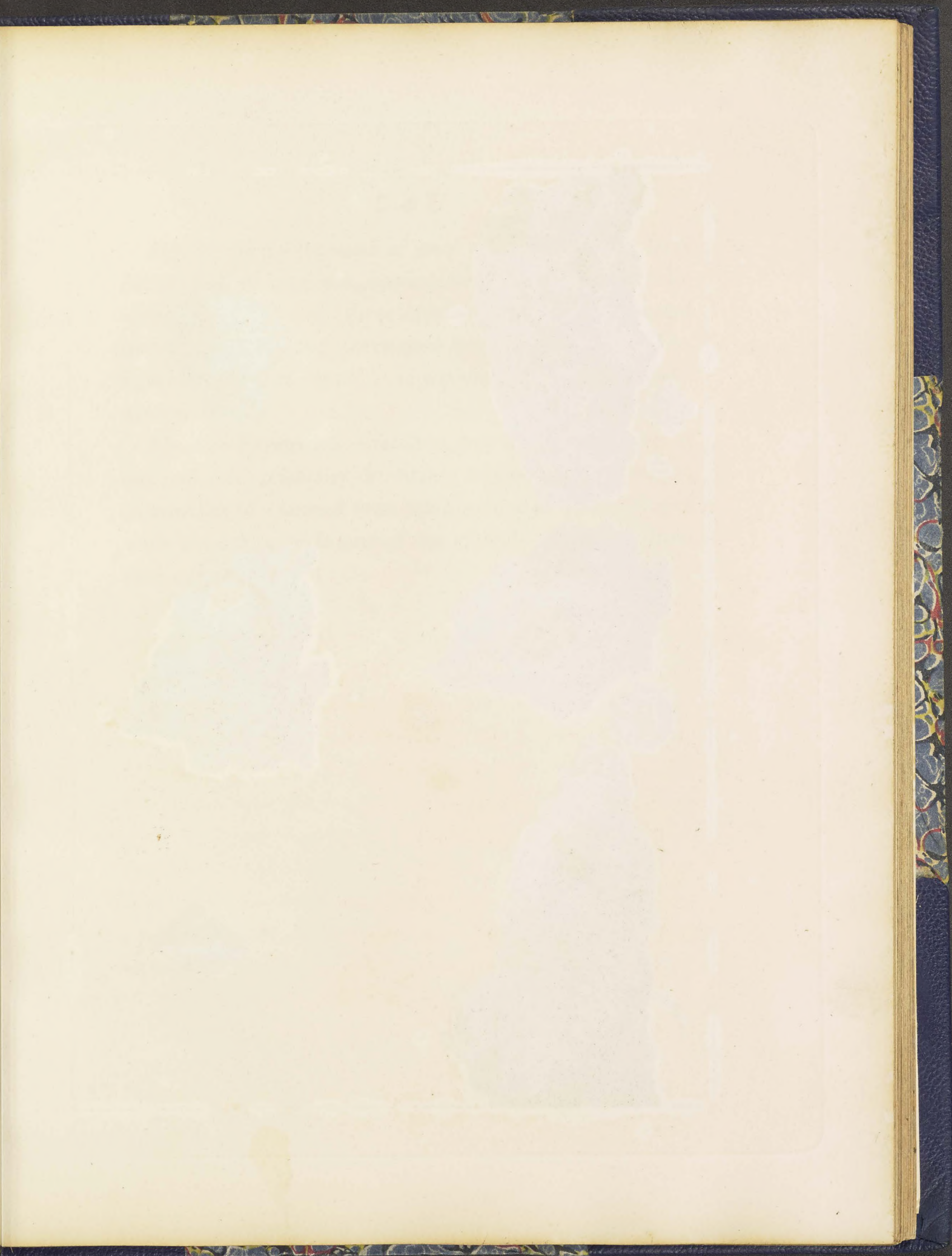
*Fig. 1.*—Is crystallized grey copper ore, consisting of thin plates crossing at right angles, rising about half of an inch perpendicular, and then bevilling off towards a point, where it forms another very small eight-sided figure. From *Cook's Kitchen*.

*Fig. 2.*—Represents a crystal of grey copper ore, having eighteen sides and truncated ends, with small brown transparent spear-pointed crystals, containing a very little copper, and a very little iron with silex. The principal contents of this specimen consists of grey sulphurated copper ore. From *Cook's Kitchen*.

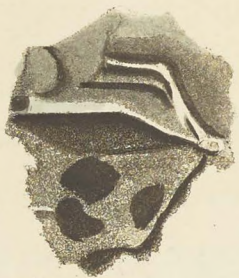
*Fig. 3.*—Is a pyramid crystal of grey copper ore with six sides, having an acute and obtuse angle alternately; this specimen is partly covered with mispickel, and resembles the Fahlerz ore. Found near *Padstow*.

*Fig. 4.*—Is a solid stone of grey copper ore, with large crystals of grey ore, having six-sided double pyramid forms, of a dark blue steel colour. *a* Represents one of the crystals in its perfect state; there are likewise other crystals of copper ore, much smaller, of a steel colour, with eight sides, as at *b*, interspersed over the stone. From *Cook's Kitchen*.





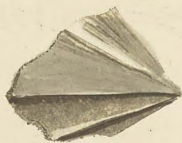




1



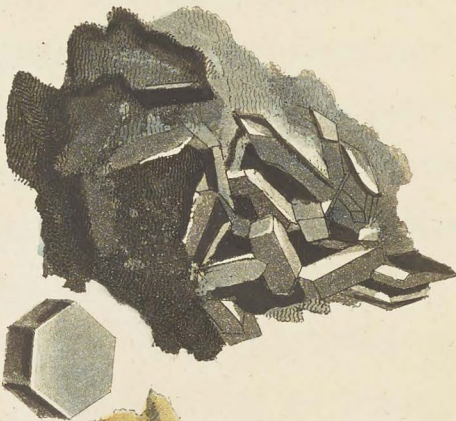
2



3



4



5



6



*Fig. 5.*—Is a solid stone of grey copper ore, with large flat crystals of grey ore, having short prisms of six sides with broad flat ends; these crystals are much intersected by each other, being interrupted in their formation. The figure of a perfect crystal is represented at *c*. From *Cook's Kitchen*.

*Fig. 6.*—Represents crystals of grey copper ore, large at one end, and gradually decreasing to a point at the other; in bunches of a curved form upon a stone of quartz, tinged with red ochre. *d* Is one of the crystals magnified, from *Cook's Kitchen*.



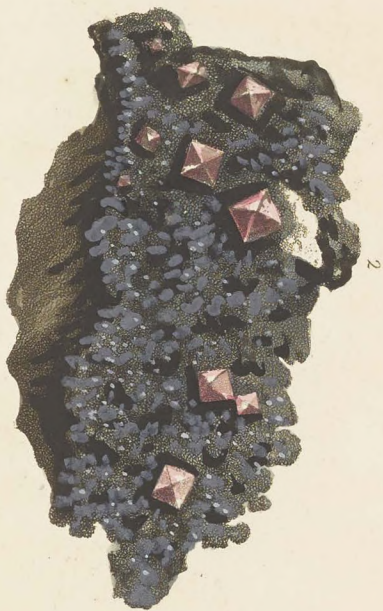
## PLATE XVI.

*Fig. 1.*—Is bright red copper ore formed in small mammillary fibrous groups, whose crystals are too small and too much confused to have the angles distinctly made out; with dark red copper ore, mixed with white quartz, as if it had been accumulated and cemented together by the copper ore. This is a very rare specimen. From *Huel Prosper*, in *Gwenier* parish.

*Fig. 2.*—Is red copper ore nearly covered with a thin coat of a grey colour, on which are crystals of red copper ore of double four-sided pyramids, very perfect and distinct. From *Gwennap* parish.

*Fig. 3.*—Is red branching copper ore, crystallized in small eight-sided figures one upon the other, in an arborescent form. This ore is the nearest of any to native copper, and is a very rare specimen. From the *United mines*, in the parish of *Gwennap*.

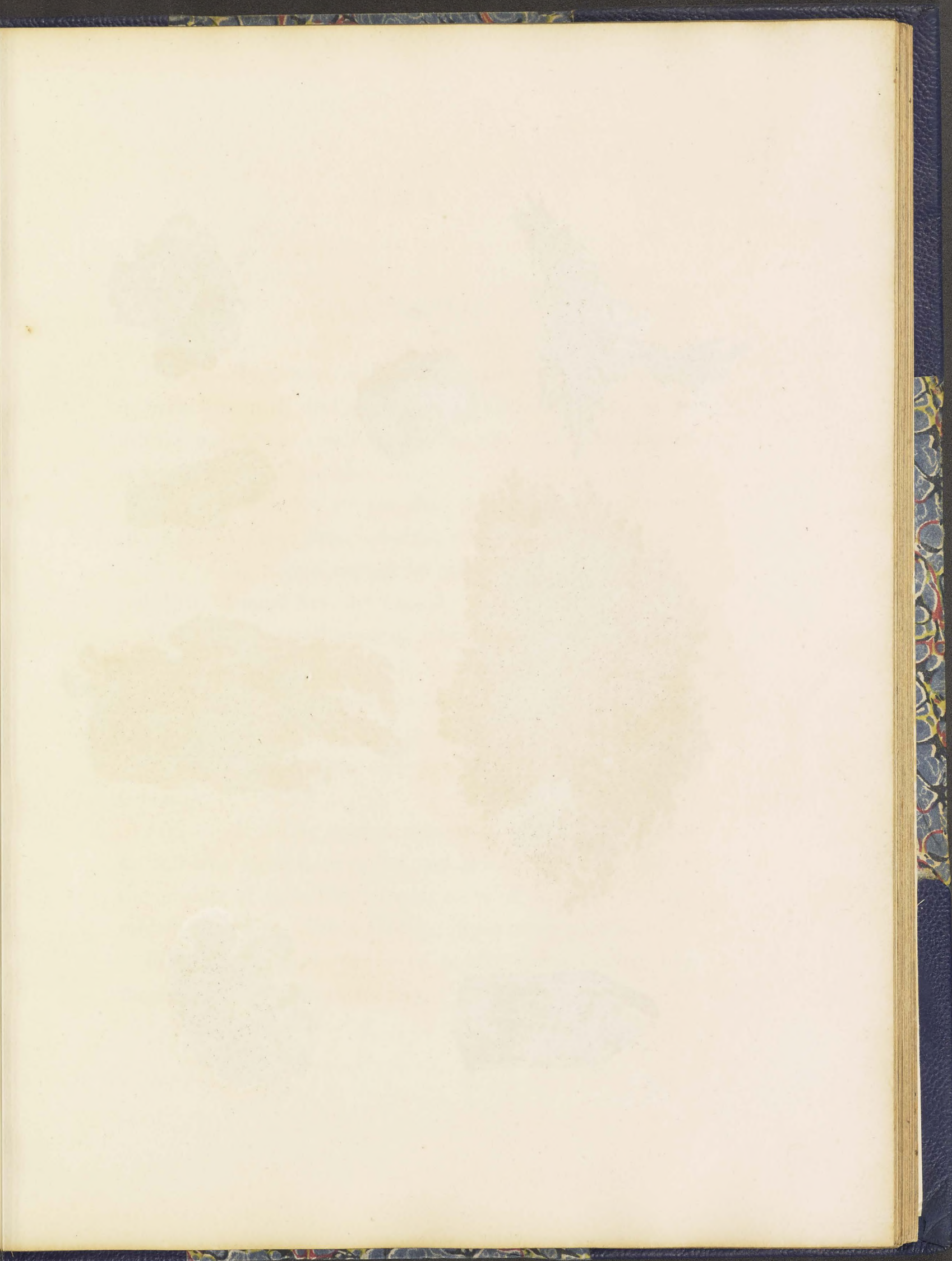














Pl. 17.

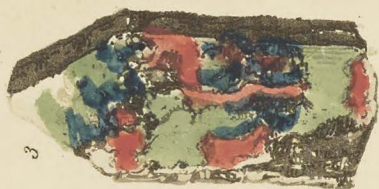
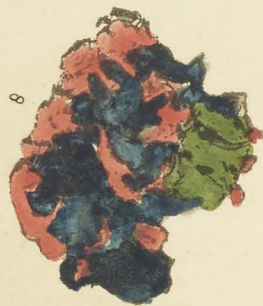




PLATE XVII.

*Fig. 1.*—Represents a cluster of native copper shooting in branches in all directions, each branch composed of an infinite number of small crystallizations. From the *United mines*, in *Gwennap* parish.

*Fig. 2.*—Is native copper shot in long four-sided wire-like figures. From *Botallack Adit*, in *St. Just* parish.

*Fig. 3.*—Is native copper in serpentine stone, cut and polished. Found near the *Lizard*.

*Fig. 4.*—Is a small piece of native copper in bright red spear-pointed crystals. *a* One of the crystals a little magnified. From the *United mines*, in *Gwennap* parish.

*Fig. 5.*—Is native copper in thin flat leaves, with jagged edges, of a brown copper colour. From *Poldory*, in *Gwennap*.

*Fig. 6.*—Is native copper, composed of several branches or leaf-like figures, very flat and thin; there is a line in the middle of each leaf, similar to what botanists call the midrib in plants. From *Poldory*, in *Gwennap* parish.

*Fig. 7.*—Is native copper in tender spiral circles, like those of a worm. From *Poldory*.



*Fig. 8.*—Is native copper with green native verdigrease. A considerable quantity of this copper was found very near the surface of the ground many years since, but none has been discovered lately. From *Mullion*, near the *Lizard*.







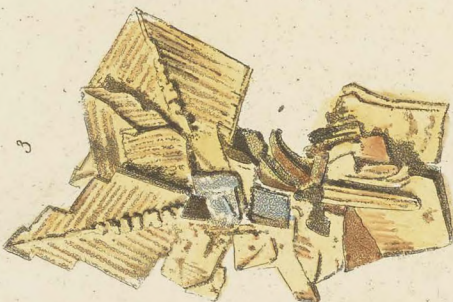




PLATE XVIII.

*Fig. 1.*—Is grey copper ore in triangular figures, like the grey silver ore, encompassed with white spatose iron ore. Found near *Padstow*.

*Fig. 2.*—Is spatose iron ore in hollow cubes and globular forms, of a yellow-brown colour; these were probably the original figures of mundic, the sulphur in which being decomposed, left the iron remaining in its original figure, upon a stone of quartz. From *Huel Cock*, in *St. Just*.

*Fig. 3.*—Is arrow head pyrites converted into iron ore. From a chalk pit near *Blandford*, in *Dorsetshire*.

*Fig. 4.*—Is spatose iron ore, with white cubic pearl spar, and pale blue cubic fluor. From *Alston Moor*, in *Cumberland*.

*Fig. 5.*—Is vermicular iron ore upon heavy spar. From *Scotland*.



## PLATE XIX.

*Fig. 1.*—Is ore of antimony in plates of twenty-six sides, having the edges bevilled, the crystals being nearly  $\frac{3}{4}$ ths of an inch broad, and  $\frac{1}{5}$ th of an inch thick, of a bright steel colour, intermixed with small semi-transparent crystals of red blend, like garnets, and small cream-coloured rhombic crystals of feldspar; all intermixed with opake quartz, and a little mundic.

*a* Represents the broad side of one of the crystals of antimony.

*b* The perspective view of the same.

*c* The ore of antimony.

*d* The red blend.

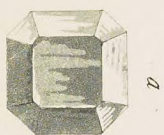
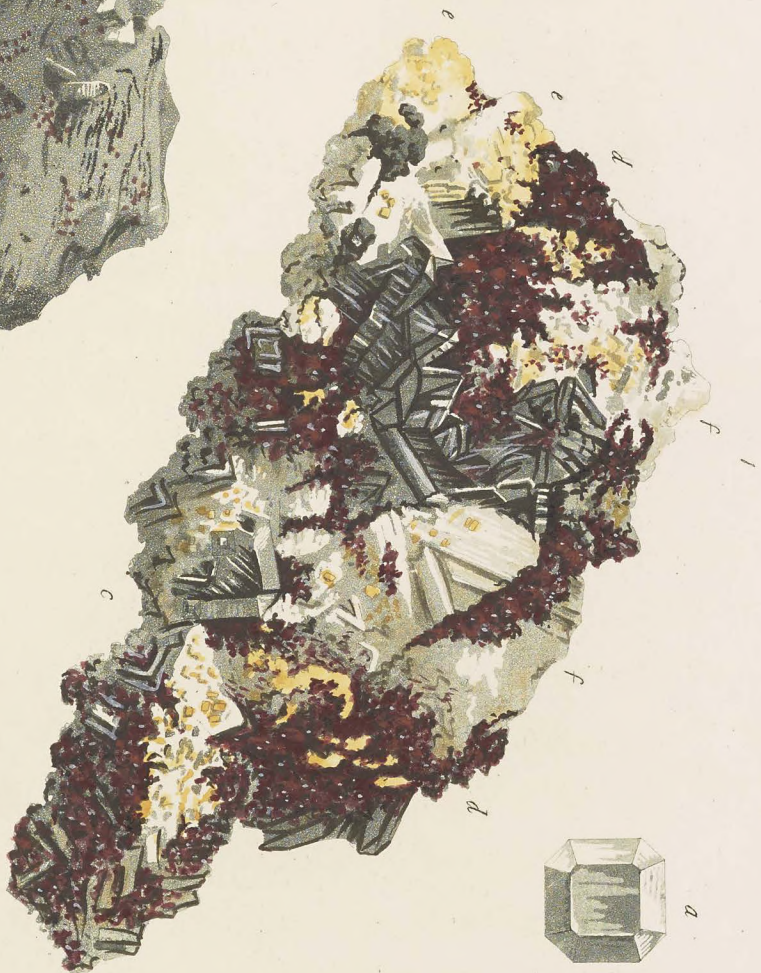
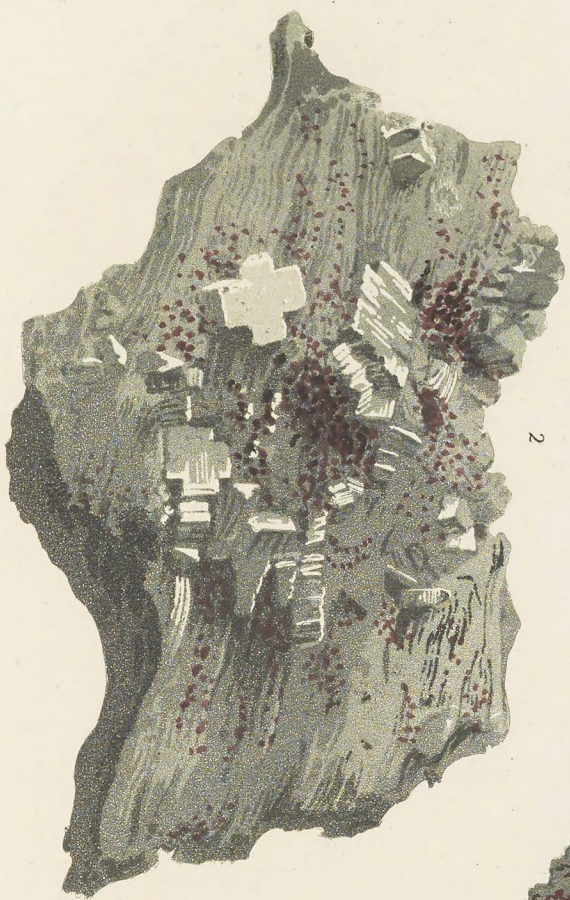
*e* The feldspar.

*f* The quartz.

This curious stone came from *Huel Boys*, in the parish of *Endellion*, and county of *Cornwall*.

*Fig. 2.*—Is ore of antimony crystallized in form of a broad cross, with the flat sides a little indented with a number of small irregular lines, and small crystals of red blend scattered over capillary ore of antimony. From *Huel Boys*; which mine has been given up some time, as not answering the expence of working.

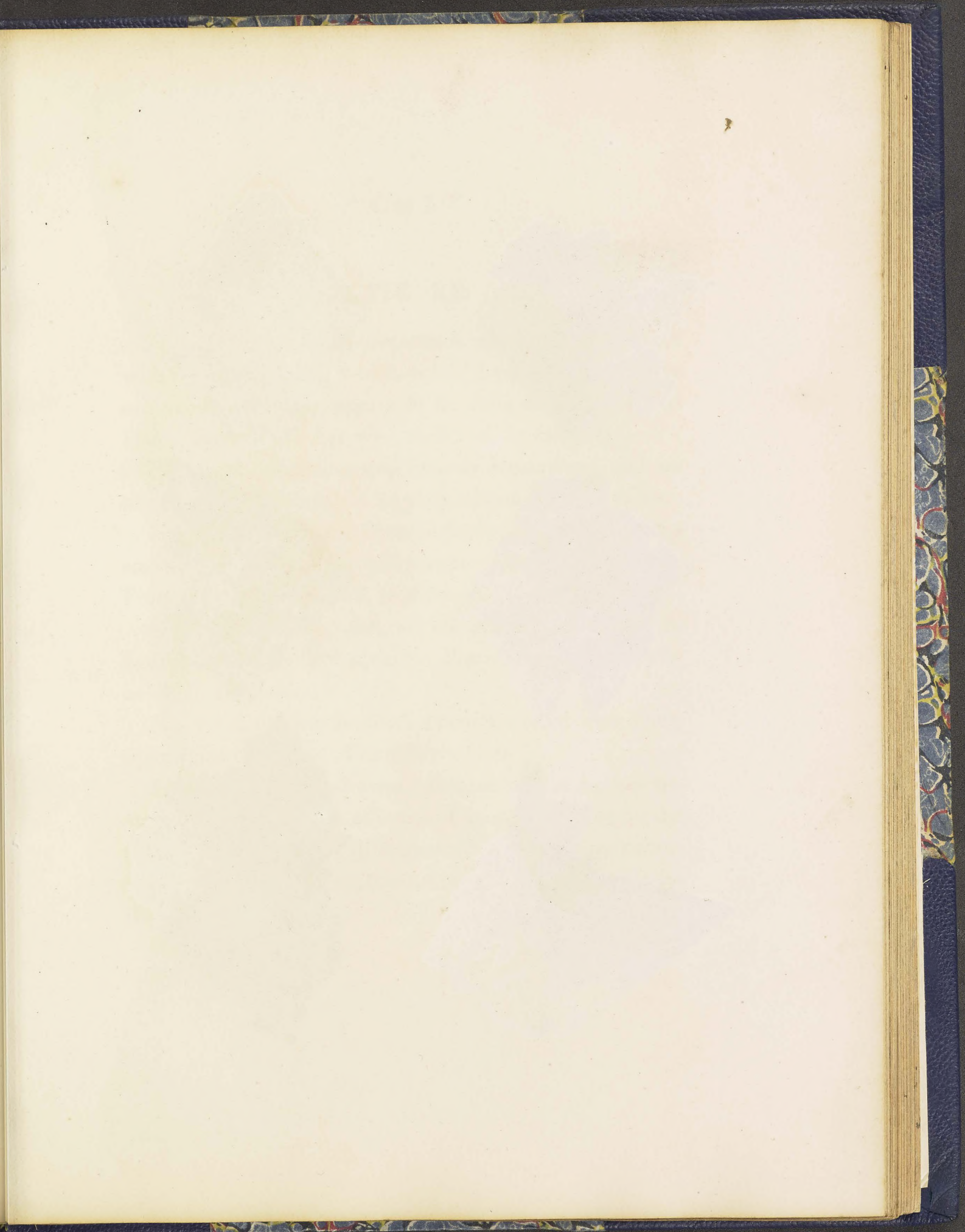




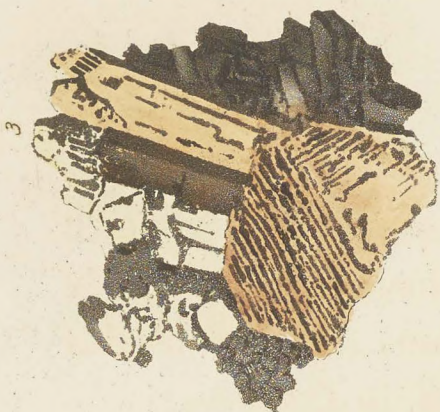
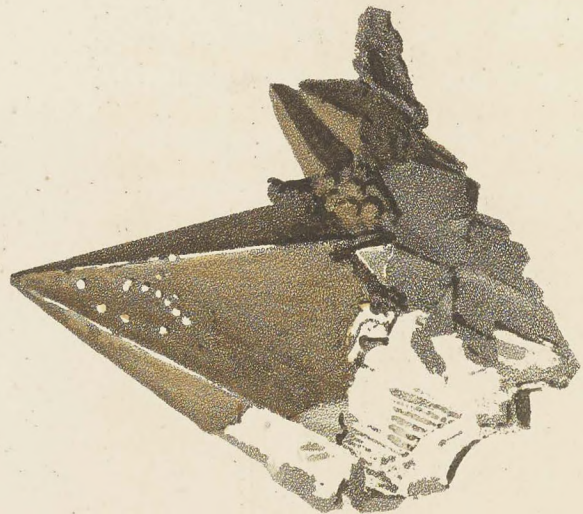














## PLATE XX.

*Fig. 1.*—Is six-sided dogs-tooth spar, nearly covered with ore of calamine, which would have decomposed the calcareous earth, as appears to be done in *fig. 2.* of this Plate. From *Ball's Eye mine*, at *Bonsal*, in *Derbyshire*.

*Fig. 2.*—Is calcareous spar entirely decomposed, and ore of calamine substituted in its place. From the same mine.

*Fig. 3.*—Is ore of calamine in four-sided figures, with a smooth surface, and bone-like appearance where broken. From the *Halken mountain*, in *Flintshire*.

*Fig. 4.*—Is yellow calamine, called waxen calamine, in figures forming hollow squares. From a mine near *Worksworth*, in *Derbyshire*.

*Fig. 5.*—Calamine in small crystals, coated over fluor, upon calcareous spar. From *Derbyshire*.

*Fig. 6.*—Is reddish-brown calamine ore, in hollow triangles, like the corners of cubes of fluor, projecting on the stone; the fluor being decomposed, and calamine substituted in its place. A rare fossil, from *Bonsal Dale*, in *Derbyshire*.



PLATE XXI.

*Fig. 1.*—Is hollow parallelogramical figures of sulphurated pyrites, having innumerable small crystals of the same on each side, and formed upon quartz. From *Poldice*, in *Gwennap* parish.

*Fig. 2.*—Is sulphurated pyrites, in four-sided figures, with a small scaly crystal of pyrites on the centre of each cubical figure. From *Poldice*.

*Fig. 3.*—Is the same kind of pyrites formed upon the ends of six-sided long crystals of quartz; the points of the quartz crystals being perfect, shew the pyrites to have been formed after the crystals of quartz became solid. From *Poldice*.

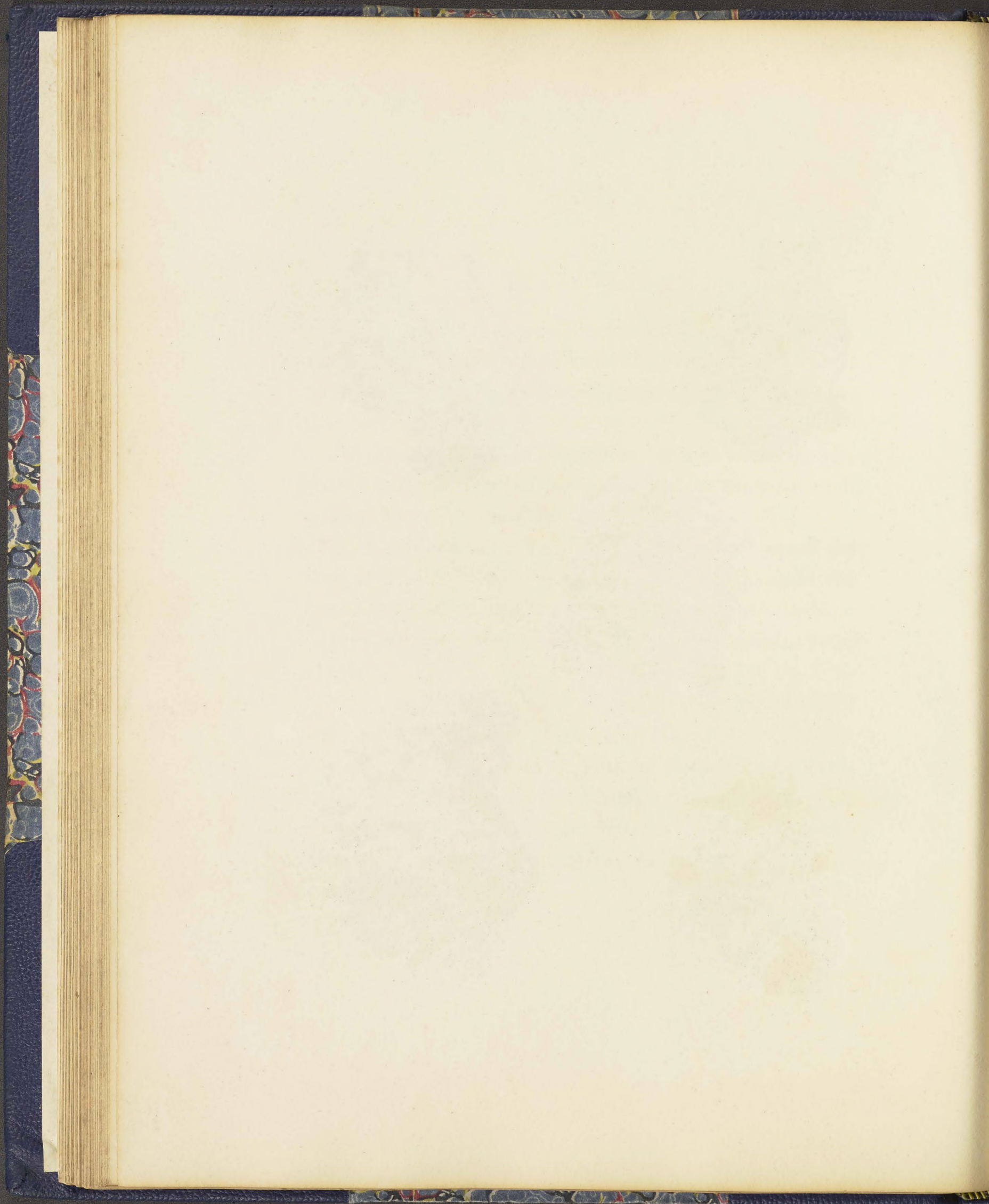
*Fig. 4.*—Is sulphurated pyrites in large flat six-sided figures of a grey colour. From *Huel Fancy*.

*Fig. 5.*—Is sulphurated pyrites in six-sided small crystals accumulated in bunches, forming from centres, with the points of the angles set so near each other as to make them nearly of a globular form on the outside. From *Huel Fancy*.

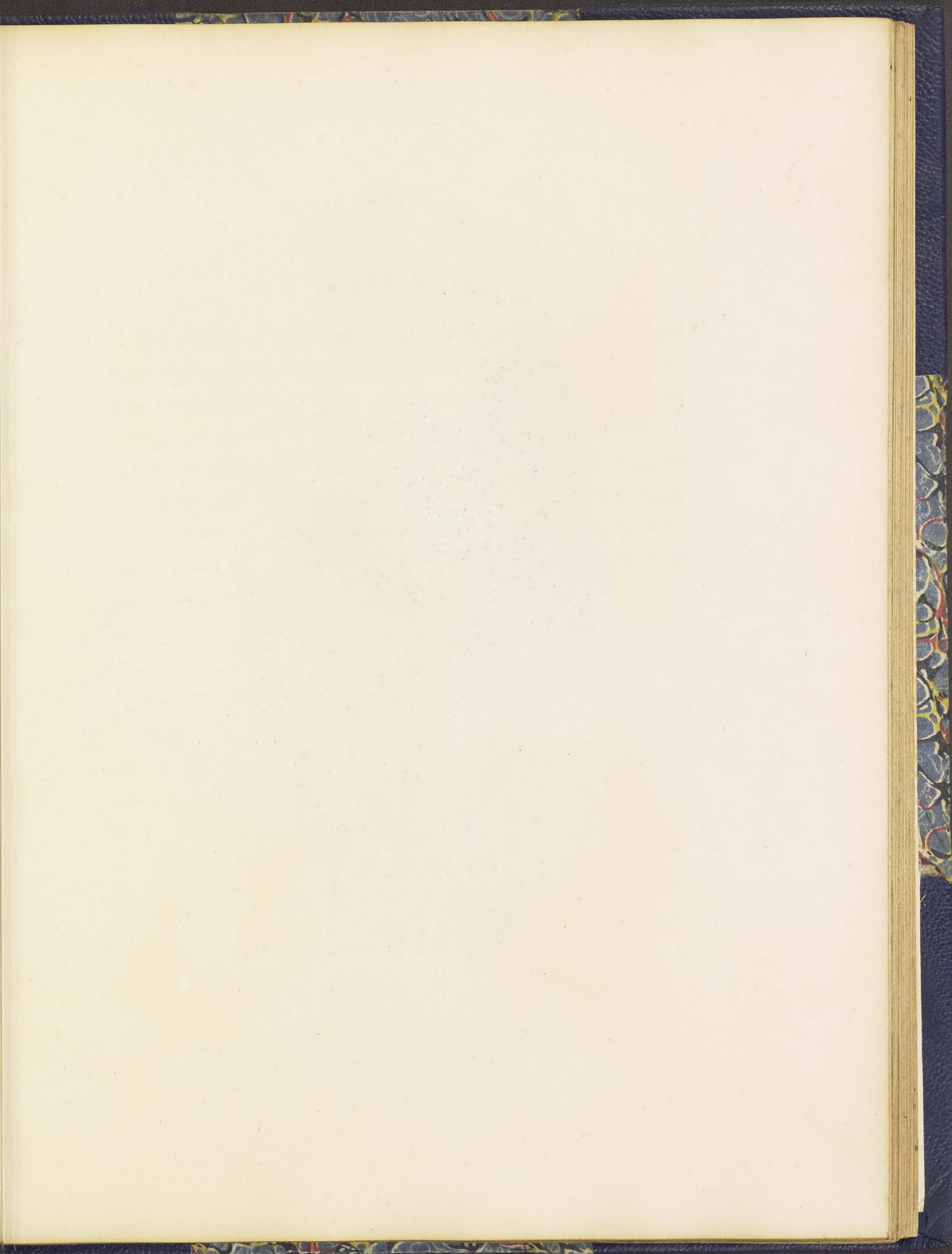






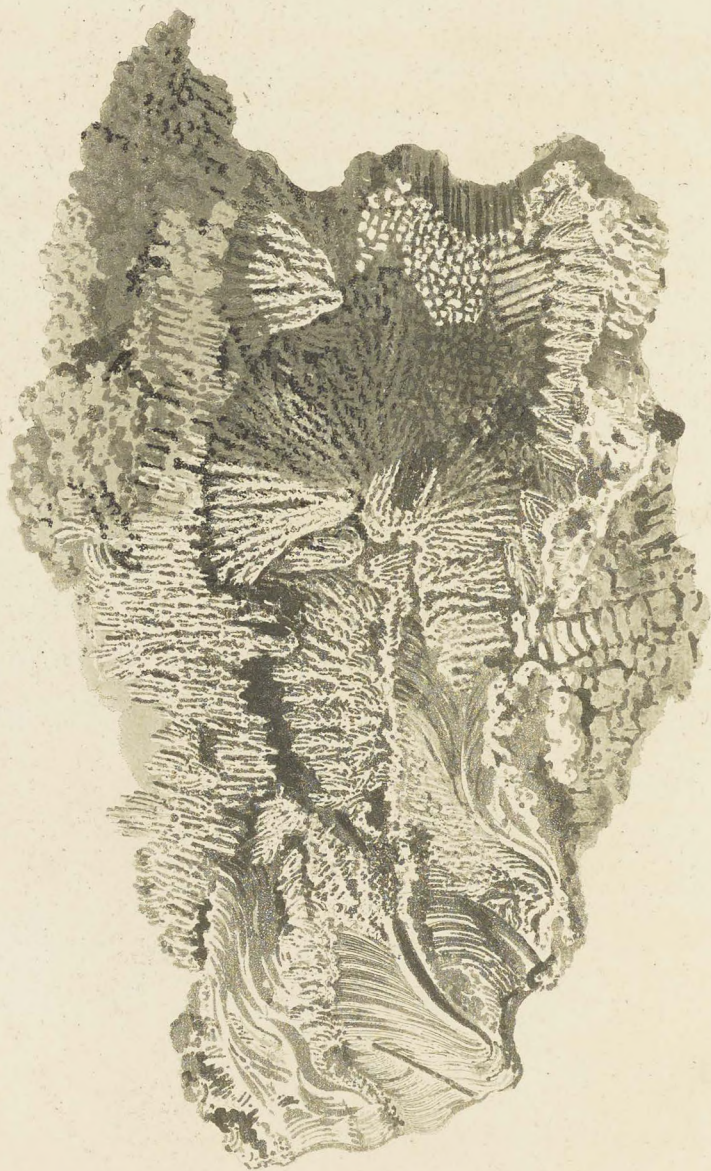








Pl. 22.





## PLATE XXII.

Represents a stone of sulphureous pyrites, with forms resembling fine feathers in one part, and at other parts having innumerable crystals of mundic, chiefly in form of cubes, which are small, and heaped one upon the other in the shape of branches, forming several together in the figure of cones, and terminating in parallelograms. This is an entire stone of grey pyrites, the figures formed in the hollow part of it. The outside of which is a little rounding, and composed of small flat irregular crystals.



## PLATE XXIII

*Fig. 1.*—Represents fluor, having several crystallizations, varying in form from each other. In the centre is a large four-sided pyramid with a small cube on the point, all of a purple colour, and transparent; on the outside is the figure of a very large pyramid of four sides, the outward surface breaking out into a number of cubical forms, with flat or truncated tops, and bevilled to the edge of each side the cube: these are all of a green colour, and transparent. On the top of this pyramid is another form of a very peculiar shape, but very regular, in twenty-six sides. From the east *Pell mine*, in *St. Agnes*.

*Fig. 2.*—Is a very large four-sided pyramid of fluor, bursting into a number of small cubical figures in every part of it, with a cross of larger crystals of the twenty-four-sided fluor on each side the angle of the pyramid. These are all of a fine purple colour, and semi-transparent. The whole is spotted with cubes of mundic, and some blend, with a crystal of quartz at each end, the top of one of the crystals of quartz is broken; all the rest of the piece is perfect. From the *Pell mine*.

*Fig. 3.*—Is green transparent fluor, with a flat top; on











each side are innumerable small cubical figures, which extend like flights of steps beyond the principal figure. The fluor is nearly surrounded with crystals of six-sided quartz.

*Fig. 4 and 5.*—Represent two pieces of fluor, with flat tops, bevilled off to the edges of the cubical angles. These are nearly the same in form, but differ in colour.



## PLATE XXIV.

*Fig. 1.*—Represents a stone of very fine grained white quartz or calcedony, full of pyramidical crystals of fluor, with onion-like coats one over the other; alternately of a very light green and milk-white colour. From *Beer Alston mine*, in *Devonshire*.

*Fig. 2.*—Is to represent a double four-sided pyramid of fluor, joined base to base, very large, semi-transparent, and of a light green colour, with six-sided crystals of quartz. From *Poldice*, in *Gwennap*.

*Fig. 3.*—Is to represent crystals of light green fluor, in four-sided pyramids, having the angles of the pyramids covered with small crystals of twenty-four-sided fluor, which are tinged with purple, and project beyond the sides of the angles of the principal figure, and ending at the angles of it with a larger crystal than those projecting on the sides of the angles, but of a similar form and colour; with transparent crystals of six-sided quartz, and a little mundic. This figure is very rare, and difficult to represent. From the *Pell mine*, in *St. Agnes*.





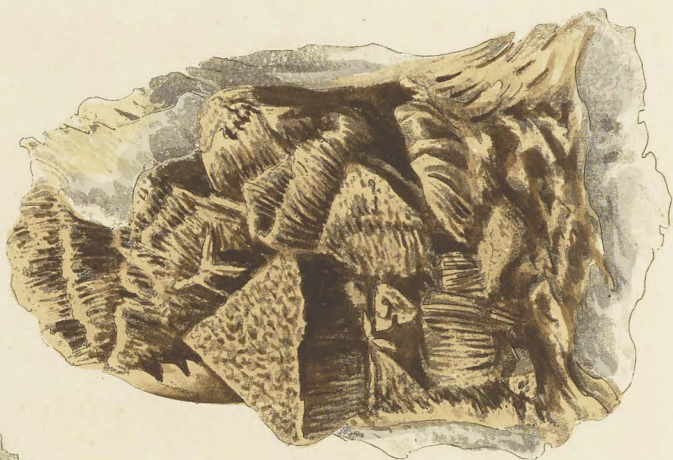
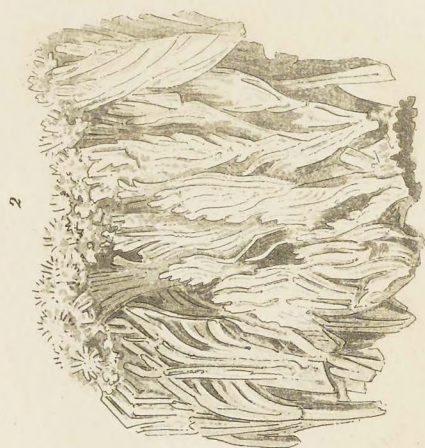














## PLATE XXV.

*Fig. 1.*—Represents small crystals of calcareous spar in form of a triangle, like a crucible, of a fibrous texture upon blend. *a* Is one of the crystals a little magnified. The transparency is No. 2 of Kirwan.\* From *Alston Moor*, in *Durham*.

*Fig. 2.*—Represents calcareous spar rising like feathers from the base, the top of each feather or branch being covered with small crystals of the same substance. Transparency, 2 Kirwan. From *Alston Moor*.

*Fig. 3.*—Represents twelve-sided calcareous spar, with short pyramids of three sides; in the centre of each is formed a small cube of yellow mundic, with a base of fluor. Transparency, 2 Kirwan. From *Cumberland*.

*Fig. 4.*—Represents calcareous spar of a fibrous texture, in form of small funguses, coated with an opake pale brown, like calamine, upon fluor mixed with lead ore. From *Durham*.

*Fig. 5.*—Represents calcareous spar, with slender cylinders adjoining each other, and forming triangular groups; covered with an opake pale-brown earth, as *fig. 4*, and with lead ore in the base. From *Durham*.

\* Mr. Kirwan describes the greatest transparency by the highest number.



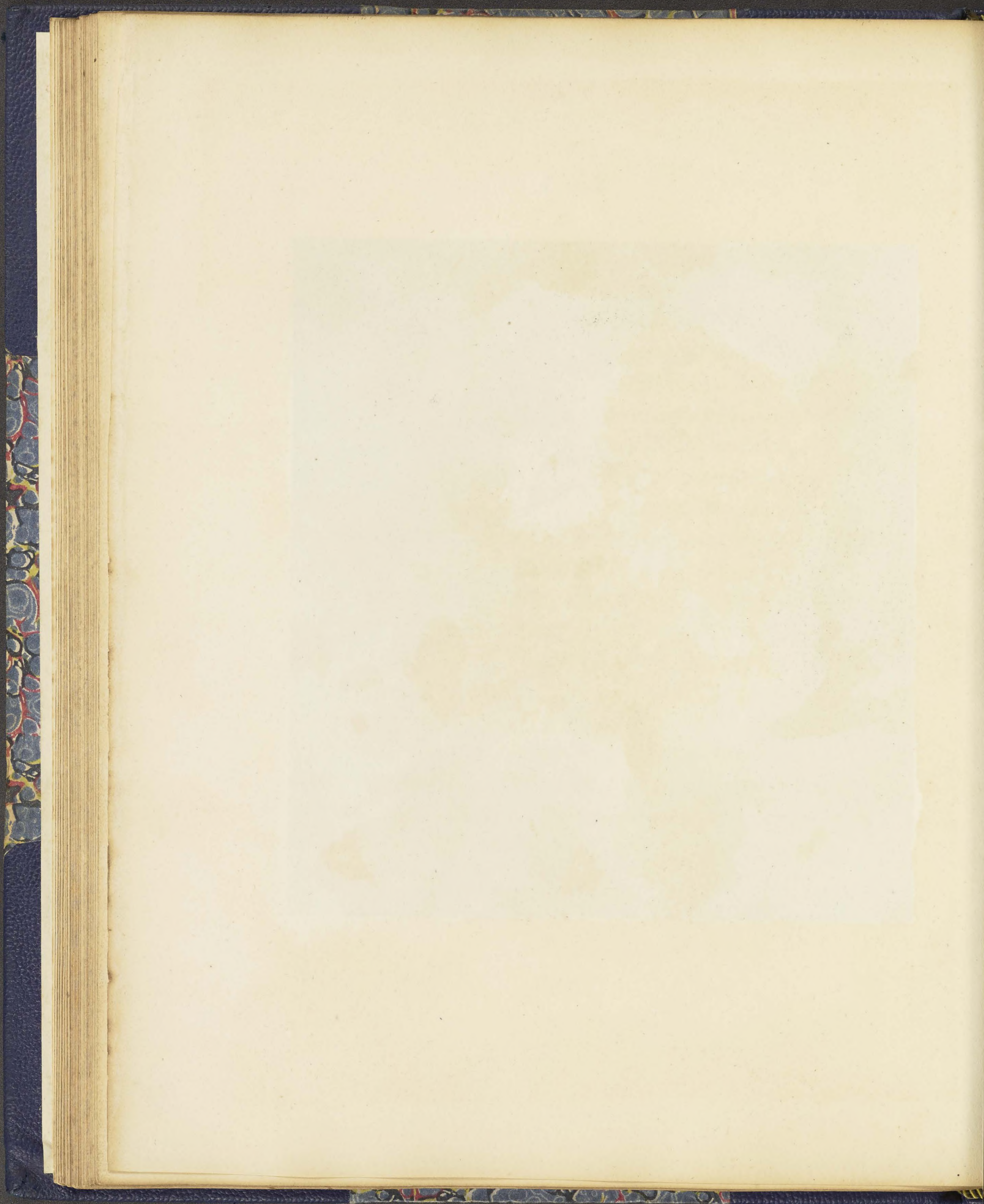
## PLATE XXVI.

Represents an elegant specimen of calcareous spar, in branches issuing from the top in fine capillary satin white shining lines, shooting from upright stems, which have small opake round balls like joints, at small distances from each other, upon the principal stems of the branches. The surface of the stone is nearly covered with groups of white botryoidal figures, one of which is in a stellated form; towards the base of the stone they become semi-transparent, and shew the colour of the body of the stone, which is a yellow sand-stone. From *Cumberland mine*, near *Matlock*, in *Derbyshire*.





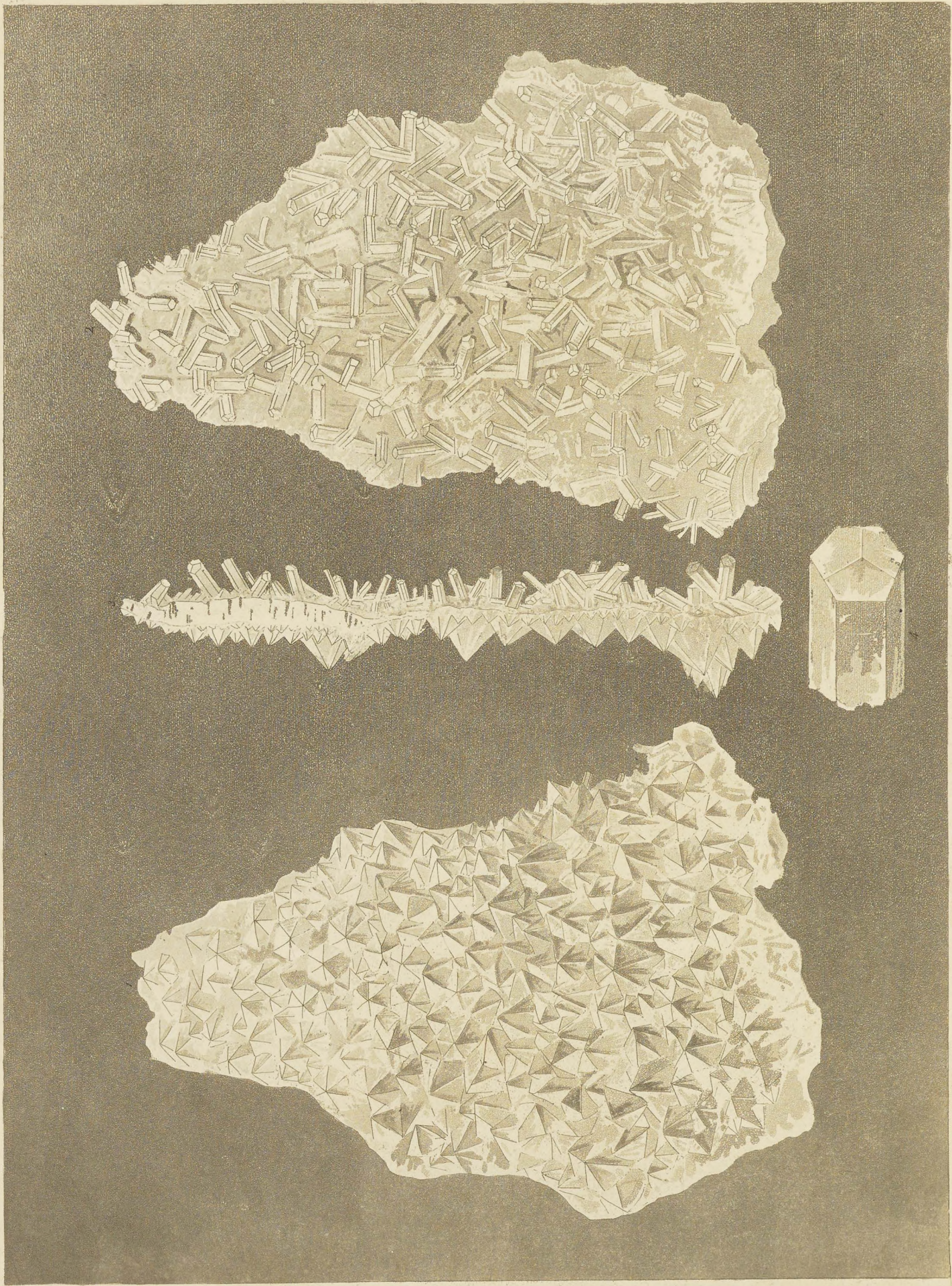














## PLATE XXVII.

This plate represents two sides and one edge of a stone.

*Fig. 1.*—Is one side, covered with crystals of quartz, grouped in six-sided pyramids nearly white, but with a very slight tinge of peach-blossom colour. Transparency, 1 Kirwan.

*Fig. 2.*—Is the opposite side, covered with crystals of calcareous spar, having columns or prisms of six sides, with short pyramid ends of three sides. Transparency, 4 Kirwan. This stone is very thin, with the quartz and calcareous spar divided perfectly by a line, as in *fig. 3*, where the two substances are properly represented.

*Fig. 4.*—Shews the figure of a crystal of calcareous spar, similar in form to those in *fig. 2*. From *Garrow Gill*, in *Cumberland*.



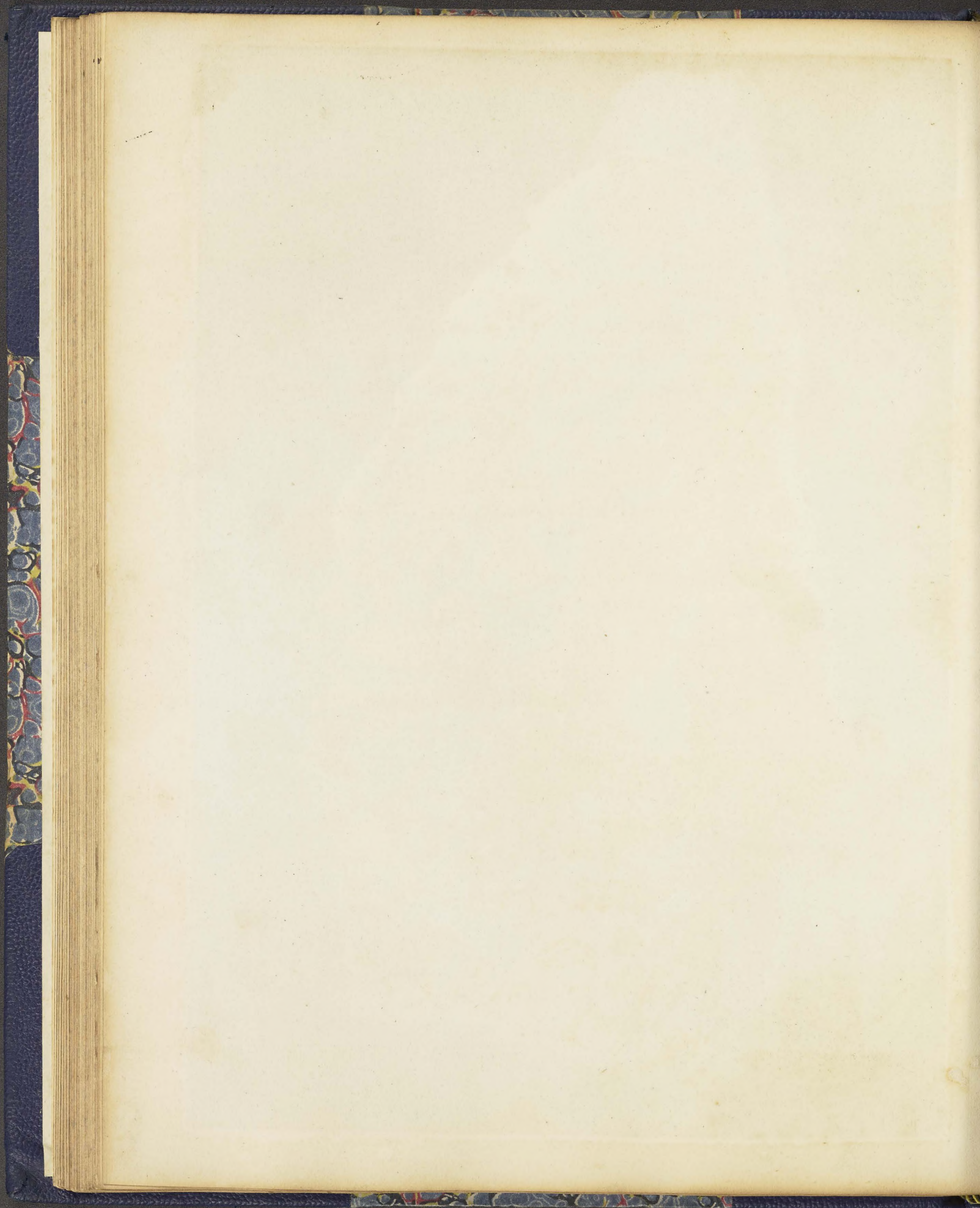
PLATE XXVIII.

Represents groups of feathered gypsum, which the miners call snow fossil, of a milk-white colour, and opake, upon brown limestone. From *Cumberland mine*, near *Matlock*, in *Derbyshire*.





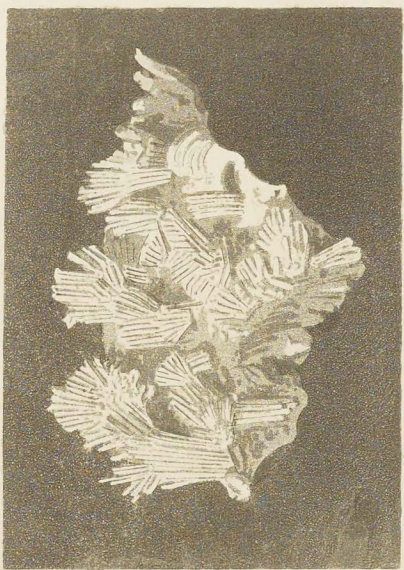












3





## PLATE XXIX.

*Fig. 1.*—Represents small clusters of gypsum upon brown limestone; consisting of transparent slender cylinders, adjoining each other at the base, and diverging towards the top; the top of each being cut off diagonally. From *Cumberland mine*.

*Fig. 2.*—Represents a single crystal of gypsum upon brown limestone. Transparency, 2 Kirwan. From the same mine.

*Fig. 3.*—Represents a specimen of gypsum about fourteen inches in length, about seven inches of which at the lower end of the piece, is composed of the minutest fibrous lines shot in all directions, like cotton wool, of a milk-white colour; and transparency, 2 Kirwan; on the top of which, extending in straight lines of about seven inches long, are capillary crystals of a light-brown colour, like the finest hair or spun glass. The whole is found shot upright upon stones, similar to *Pl. xxviii*. It is of such a tender form, as to make it almost impossible to move it in its natural state, without injury. From the same mine.



## PLATE XXX.

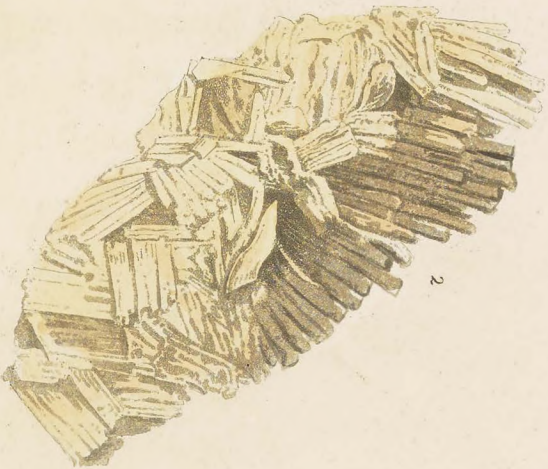
*Fig. 1.*—Represents opake white striated lead ore, diverging from different centres. From the silver mines in *Tipperary*, in *Ireland*.

*Fig. 2.*—Represents white lead ore, inclining to straw yellow; consisting of prisms standing parallel to each other, having thin plated white crystals of lead ore shooting in all directions at the bottom of the prisms. From *Burne mine*, in *Durham*.

*Fig. 3.*—Is to represent solid white lead ore, with a slight peach-flower tinge and glossy striated fracture, in a stone of black manganese. From *Mendip Hills*, near *Bristol*.

*Fig. 4.*—Represents white crystals of lead ore, forming rectangular plates, with the edges bevilled from all sides, in the hollow part of an iron ore. Transparency, 2 Kirwan.  
*a* One of the crystals of lead ore a little magnified. From *Huel Rose*, a mine near the *Low Pool*.

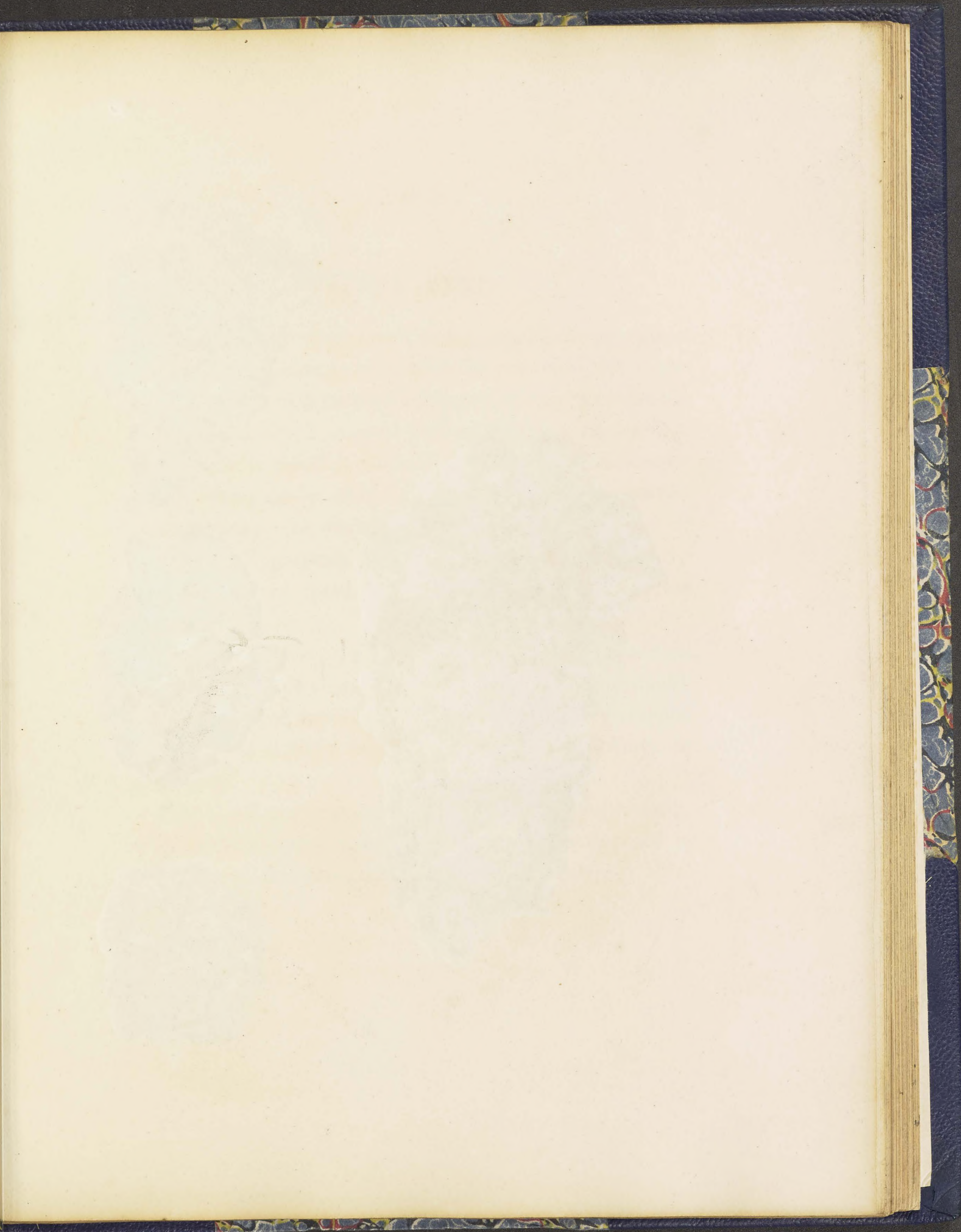




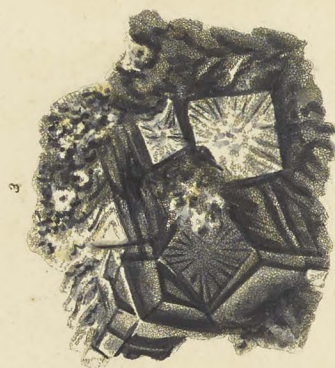














## PLATE XXXI.

*Fig. 1.*—Represents four-sided pyramidical crystals of lead ore joined base to base, with the points of the angles truncated so as to form parallelograms, having small similar crystals, and blend, in some parts of the triangular sides of the pyramids. Small crystals of purple fluor and small crystals of blend are sprinkled over the stone, which consists of semi-transparent white cubic fluor. From *Derbyshire*.

*Fig. 2.*—Represents similar crystals of lead ore, with the angles less interrupted; of a pigeon-neck colour. From *Derbyshire*.

*Fig. 3.*—Represents common lead ore with pyramidical crystals, truncated nearly at half the height of the pyramid, bursting on the top into a number of flat spear-shaped figures, with a little transparent fluor. From *Eyam*, in *Derbyshire*.

*Fig. 4.*—Represents common lead ore of a cubic form, with internal square figures, having the sides opposed to the angles of the outward cubes. From *Derbyshire*.



## PLATE XXXII.

## FIGURED TIN ORES.

*Fig. 1.*—Represents a perfect crystal of wood-like tin ore, of an oval or pear-shaped form, and a yellowish-brown colour. Found near *St. Austell*.

*Fig. 2.*—Represents a small cylindrical figure of black tin ore. Found near *St. Austell*.

*Fig. 3.*—Represents botryoidal figures of wood-like tin ore, of a black colour.

*Fig. 4.*—Represents botryoidal wood-like tin ore, of a brown colour, covering the point of a crystal of opaque white quartz. From *Sithney* parish.

*Fig. 5.*—Represents a circular fragment of wood-like tin ore, hollow in the centre, of a reddish-brown colour.

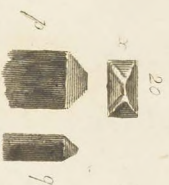
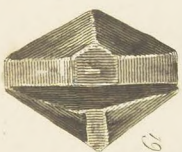
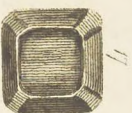
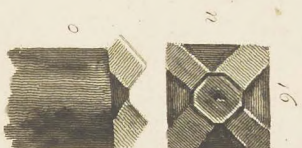
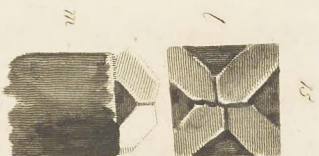
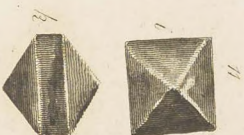
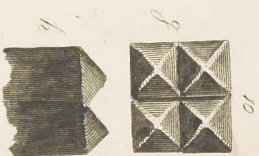
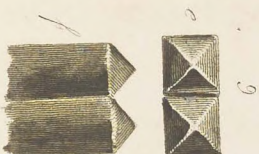
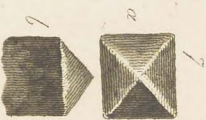
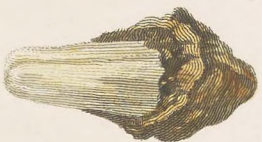
*Fig. 6.*—Represents stellated tin ore, nearly of a black colour. From *Huel Prosper*, in *St. Agnes*.

*Fig. 7.*—Represents a crystal of tin ore, being a four-sided prism as at *b*, terminated by a four-sided pyramid as at *a*, of a black-brown colour and glossy appearance, which is the most regular figure of tin crystals.

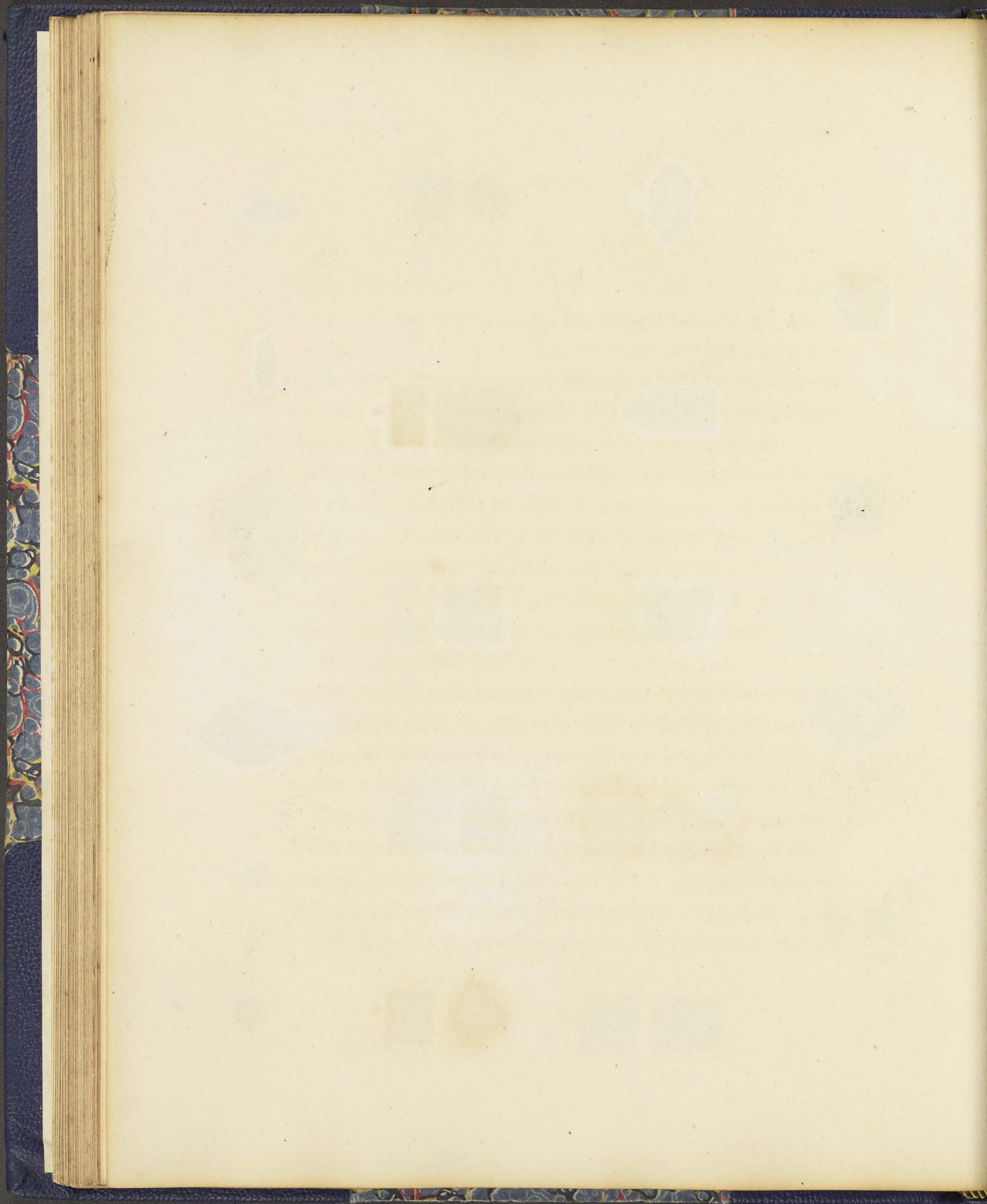
*Fig. 8.*—Represents a crystal of black tin ore, being a



Figured Ten. Drs.









## FIGURED TIN ORES CONTINUED.

prism of four sides, two of which are nearly double the breadth of the intermediate sides, terminated by a four-sided pyramid; the angles of the pyramid being opposite to the planes of the prism. From the *Wherry mine*, near *Penzance*.

*Fig. 9.*—Represents a double crystal of tin ore, consisting of two four-sided prisms, terminated by two four-sided pyramids. Transparency, 2 Kirwan.

*Fig. 10.*—Represents a crystal of tin ore, being a four-sided prism, terminated in four four-sided pyramids.

*Fig. 11.*—Represents a crystal of tin ore with a short four-sided prism, terminated at both ends by a four-sided pyramid.

*Fig. 12.*—Represents a crystal of tin ore, having a short prism terminating in a four-sided pyramid; the narrow sides of which ending in a point, and the broad sides in a right line, form together a sharp edge on the top; the under side imbedded in the matrix, which is steatites.

*Fig. 13.*—Represents a crystal of tin ore with a prism of four sides, on the top of which, tending towards a pyramid, it divides into eight sides; four of the angles corresponding with the angles of the prism, and the other four



## FIGURED TIN ORES CONTINUED.

angles with the planes of the prism; terminating in a small four-sided pyramid. From *Gaverigan*, near *St. Dennis*.

*Fig. 14.*—Represents a crystal of tin ore, being a four-sided prism, composed of a number of small crystals joined side by side, terminating in a plane four-sided pyramid, having the angles opposite the sides of the prism. From the *Wherry mine*, near *Penzance*.

*Fig. 15.*—Represents a crystal of tin ore, being a prism of four sides, terminated by a pyramid of four sides, of which the angles are truncated, and are broader than the remaining triangular planes of the pyramid, and joining in a point at the centre. From *Huel Kine*.

*Fig. 16.*—Represents a prism nearly similar to the last, but with the exception, that the truncated parts of the pyramid terminate in a figure of eight sides. From *Trevaunance*.

*Fig. 17.*—Represents a similar pyramid to the last, having the figure in the centre much broader, and the sides of the angles of the pyramid less truncated.

*Fig. 18.*—Represents a pyramid of four sides, bursting into a great number of small pyramidal crystals on the top; called by the miners, quilted tin ore.



FIGURED TIN ORES CONTINUED.

*Fig. 19.*—Represents a double crystallization, having part of a pyramid nearly similar to *fig. 16*; the other part divided in the top, but joined together as one crystal in the bottom.

*Fig. 20.*—Represents a parallelogramic prism, terminating in a four-sided pyramid.



## PLATE XXXIII.

## FIGURED COPPER ORES.

*Fig. 1.*—Triangular yellow copper ore.

*Fig. 2.*—Yellow copper ore, being a prism of <sup>six</sup>~~eight~~ sides, having every alternate angle much more obtuse than the other angle, and a flat pyramid of three planes. This is an uncommon crystal of copper ore both in form and size; it is very thinly coated with blend, the yellow ore being visible in fine streaks between the blend. It has a very bright splendid appearance of polished steel, when the light is reflected on it in a particular angle. *a* The pyramidal top. *b* The prism.

*Fig. 3.*—Is a very irregular figure, but very perfect in all its angles. It is, like the last, yellow copper ore, thinly coated with blend, of an indigo colour.

*Fig. 4.*—This is another extraordinary figure of yellow copper ore. *c* Represents the front view. *d* The side view. See *Pl. VII.*

*Fig. 5.*—Stalactical cellular yellow copper ore.

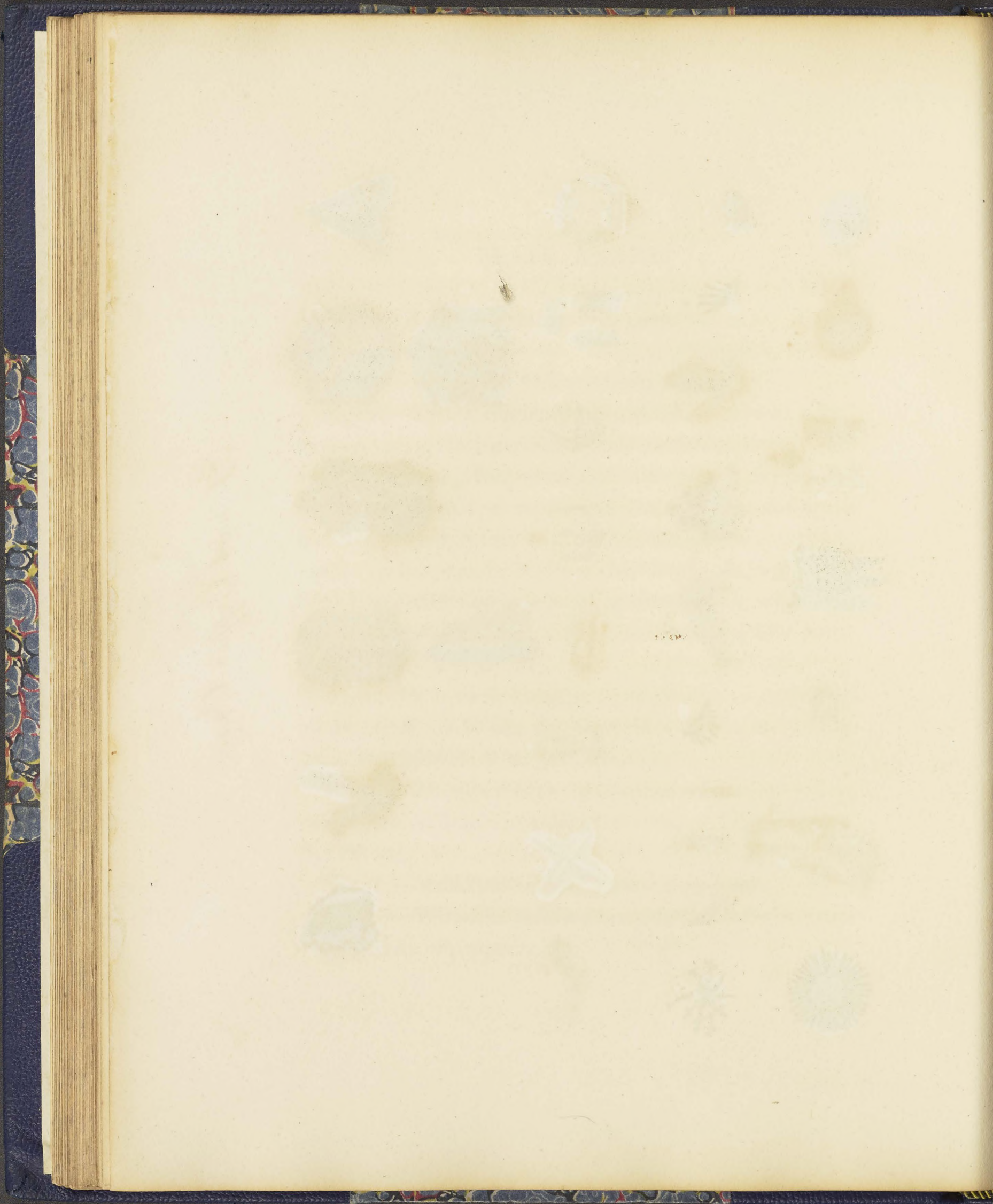
*Fig. 6.*—Wire-like yellow copper ore, coated with green efflorescence of copper.



*Figured Copper Ore.*









FIGURED COPPER ORES CONTINUED.

*Fig. 7.*—Is a six-sided short prism of grey copper ore, terminated by two flat ends. Similar forms are found of an emerald green: but much thinner. See *Pl. ix.* and *Pl. xv.*

*Fig. 8.*—Is a four-sided prism of grey copper ore, having two of the opposite sides bevelled off to an edge.

*Fig. 9.*—Grey copper ore, with two pyramidical crystals of six sides, joined base to base.

*Fig. 10.*—A short six-sided prism of grey copper ore, terminating in a six-sided truncated ~~prism~~ *pyramid*.

*Fig. 11.*—A six-sided prism of grey copper ore, truncated at both ends.

*Fig. 12.*—A crystal of grey copper ore, smooth and glossy, being a prism of six sides, broad on the top, which is truncated, and running taper to the base, where it issues from the stone.

*Fig. 13.*—Grey copper ore of a rusty colour, in form of a cross.

*Fig. 14.*—Bright steel-coloured grey copper ore, composed of small plates one over the other, in a figure that is broad and round at one end, and pointed at the other, and bounded by curved lines.



## FIGURED COPPER ORES CONTINUED.

*Fig. 15.*—Arsenical needle copper ore, of a pale yellowish-green colour. Transparency, 3 Kirwan.

*Fig. 16.*—Arsenical copper ore with pointed tops, increasing in diameter towards the base where they join the stone, of the darkest opake green colour.

*Fig. 17.*—Arsenical needle copper ore, grouped in form of camels' hair brushes, of an olive-green colour. Transparency, 3 Kirwan.

*Fig. 18.*—Arsenical copper ore in small pointed crystals, grouped together in a botryoidal form, and of an olive-green colour. Transparency, 2 Kirwan.

*Fig. 19.*—Arsenical copper ore with small needle crystals, shooting in all directions from a stalactite, of an olive-green colour. Transparency, 3 Kirwan.

*Fig. 20.*—Arsenical copper ore, in form of short cylindrical stalactites, of an emerald-green colour. Transparency, 1 Kirwan.

*Fig. 21.*—Arsenical copper ore, having two flat sides, with spear-shaped ends, of an olive-green colour. Transparency, 2 Kirwan.

*Fig. 22.*—Arsenical copper ore of an oval serrated form, composed of small plates, of an olive-green colour. Opake.



## FIGURED COPPER ORES CONTINUED.

*Fig. 23.*—Arsenical crystals of copper ore, forming long ovals, with minute fibres of an apple-green colour. Transparency, 1 Kirwan.

This crystal differs from the last, in being composed of minute fibres, and being a longer oval, and of a lighter colour; and that *fig. 22*, is composed of thin plates.

*Fig. 24.*—Malachite copper ore in an arborescent form, an emerald colour, and opake.

*Fig. 25.*—Arsenicated copper ore of a mammillary form, indigo colour, and opake when in the mass; but when divided the form becomes stellated, and of a smalt colour, as

*Fig. 26.*—Represents it, and the transparency, 3 Kirwan.

*Fig. 27.*—Arsenicated copper ore, being a four-sided prism bevilled at the end to the point of an edge, from two of the opposite sides of the prism; the other two sides extend only to the bottom of the pyramid, and then slope off to an edge, making a chisel-shaped top of two planes, having three sides each. The colour is the deepest green, nearly black. The transparency, 1 Kirwan.

*Fig. 28.*—Arsenicated copper ore in form of stalactites, composed of several crystals one over the other, of the darkest blue colour.



FIGURED COPPER ORES CONTINUED.

*Fig. 29.*—Thin plated copper ore with two square sides, bevelled at the edges, of a dark blue colour.

*Fig. 30.*—Arsenicated copper ore, in the form of a white feather.

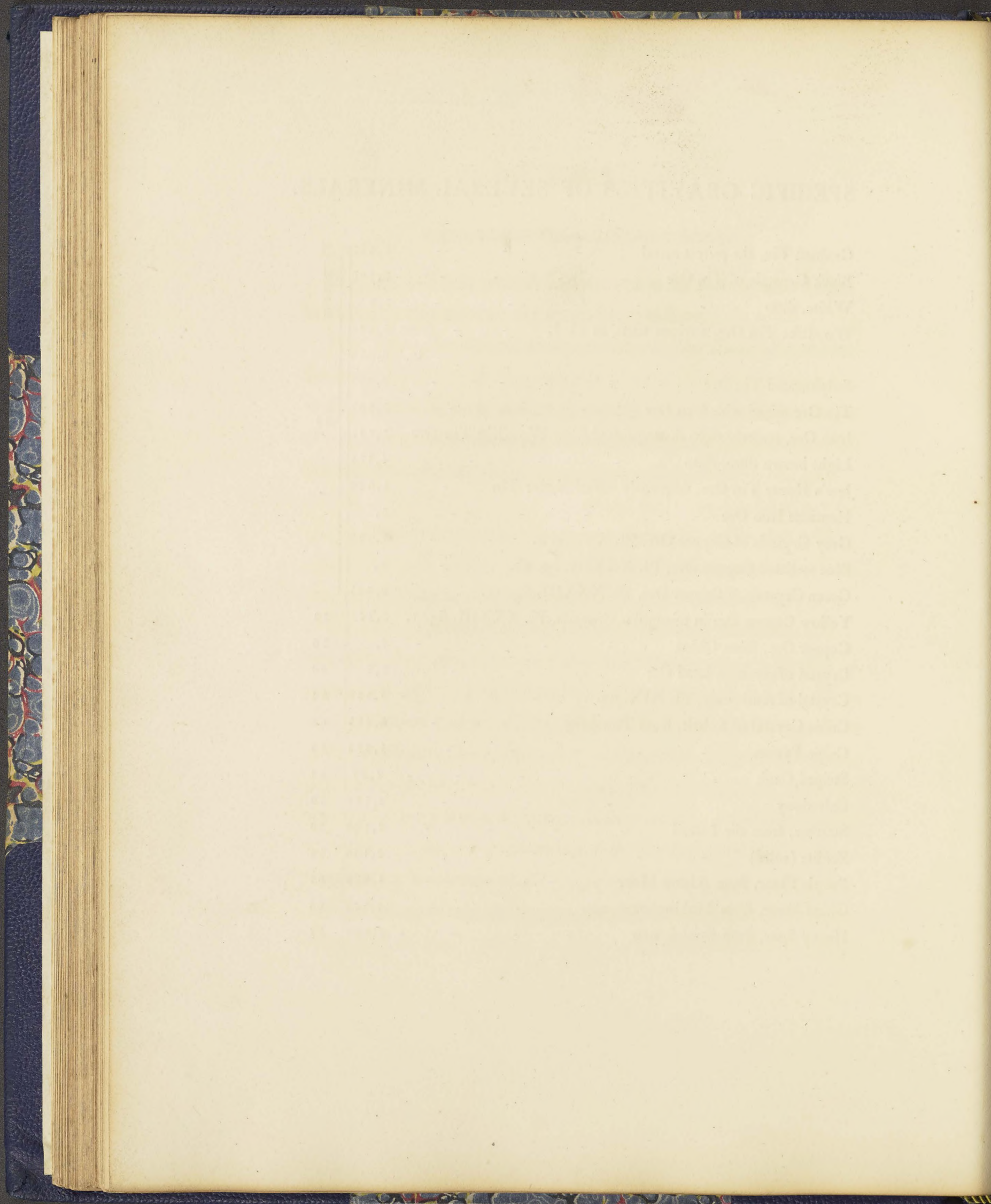
*Fig. 31.*—Brown stellated copper ore, with larger rays of a green colour, shooting from the circle of the brown ore. See *Pl. VIII. fig. 1.*



## SPECIFIC GRAVITIES OF SEVERAL MINERALS.

Grained Tin, the purest metal	-	-	-	7,857	Thermometer
Black Crystals of Tin Ore	-	-	-	7,166	
White, ditto	-	-	-	7,8	
Woodlike Tin Ore, various sorts, as Pl. I.	-	-	from	6,043	
			to	6,958	
Sulphurated Tin Ore	-	-	-	4,333	
Tin Ore mixed with Iron Ore	-	-	-	5,587	64
Iron Ore, scarcely to be distinguished from Woodlike Tin Ore				3,717	
Light brown ditto, ditto	-	-	-	4,375	
Jew's House Tin Ore, frequently called Native Tin	-			5,640	
Hematite Iron Ore	-	-	-	5,	
Grey Crystals of Copper Ore, Pl. XV. fig. 5.	-	-	-	5,909	
Blue stellated Copper Ore, Pl. XXXIII. fig. 25.			-	5,	
Green Crystals of Copper Ore, Pl. XXXIII. fig. 17.			-	2,625	
Yellow Copper Ore in triangular Crystals, Pl. XXXIII. fig. 1.				4,323	50
Copper Ore, from China	-	-	-	4,	56
Crystal of common Lead Ore	-	-	-	7,5	50
Crystal of Antimony, Pl. XIX. fig. 1.	-	-	-	5,588	64
Cubic Crystal of Kobalt, from Tunaberg			-	6,415	64
Cubic Pyrites	-	-	-	5,078	50
Striped Cauc	-	-	-	4,25	63
Calcedony	-	-	-	2,583	50
Steatites, from the Lizard	-	-	-	2,148	50
Zeolite (solid)	-	-	-	2,196	50
Purple Fluor, from Alston Moor	-	-	-	1,666	63
China Stone, from Linkinghorne, new	-		-	2,545	66
Heavy Spar, from Bristol, new	-	-	-	3,668	52







SPECIMENS  
OF  
BRITISH MINERALS,

SELECTED FROM  
THE CABINET

OF  
PHILIP RASHLEIGH,  
OF MENABILLY, IN THE COUNTY OF CORNWALL, ESQ. M. P.  
F. R. S. AND F. A. S.

WITH  
GENERAL DESCRIPTIONS OF EACH  
ARTICLE.

THE SECOND PART.

LONDON:

PRINTED BY W. BULMER AND CO.  
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MAY, 1802.







## OBSERVATIONS.

COUNTRIES which abound in Mines are continually producing new objects of curiosity, interesting both to the Chemist and to the Naturalist ; and no part of Europe probably affords a greater variety of Minerals than the county of Cornwall. During the last ten years, in which the study of Chemistry has been much extended and improved, Minerals of various sorts have been discovered in places where they were before unknown : and such is the attention given to Chemical Investigation, that few subjects escape having their nature and use distinctly ascertained.

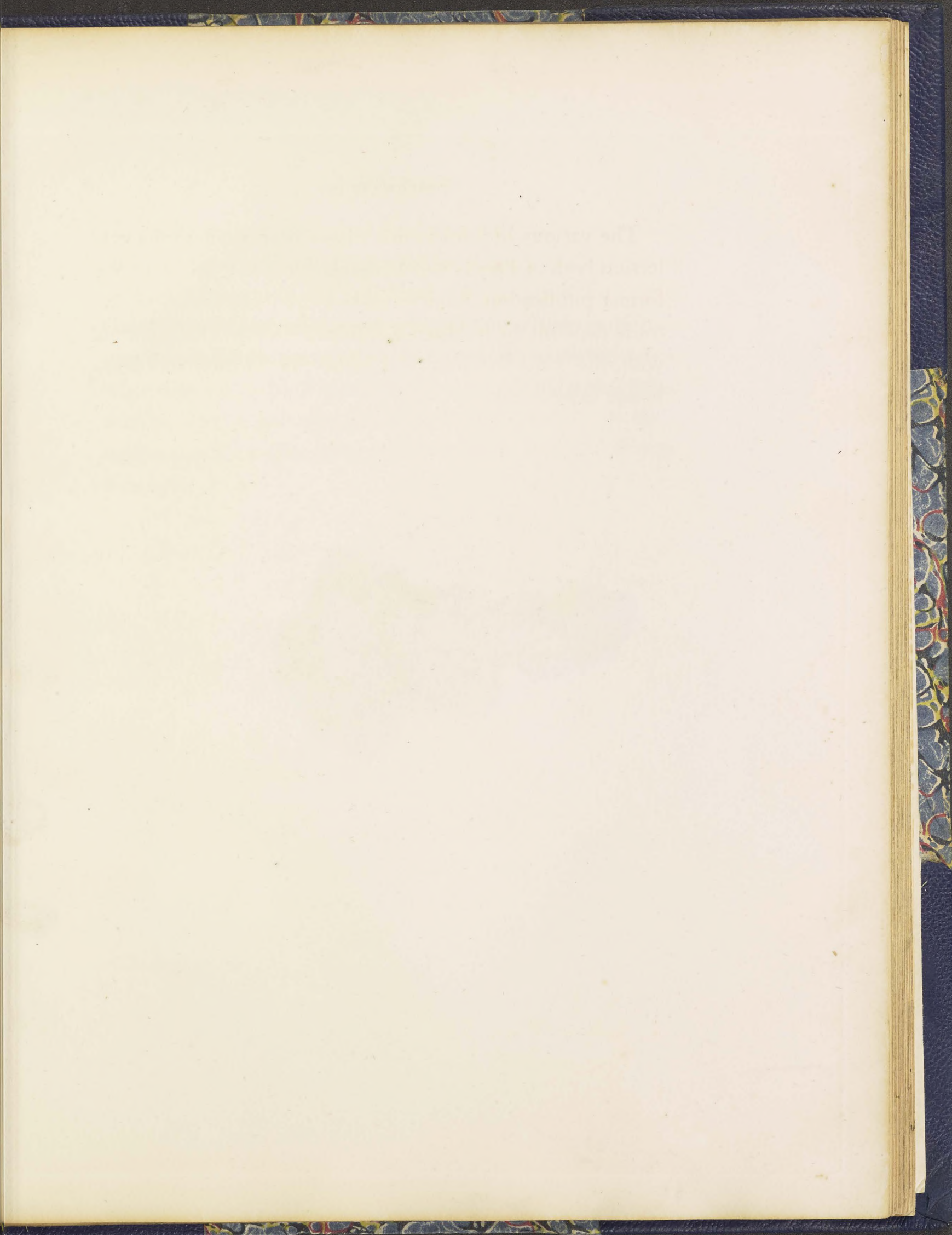
The Editor of these Sheets does not profess to be well enough acquainted with the science and nomenclature of modern Chemistry, or to be sufficiently practised in chemical experiments, to give a complete Analysis of the subjects exhibited in the following Plates ; but inasmuch as accurate representations of curious specimens of the Mineral Kingdom may contribute to the amusement of those who delight in such studies, he flatters himself, that those who view them will derive some gratification from the work, although they may not receive from it the full information which they may expect.



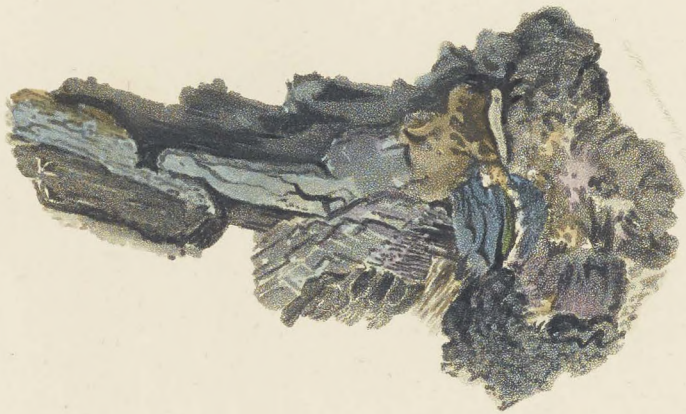
#### OBSERVATIONS.

The various additions which have been made to the collection both of Fossils and Minerals, since the period of the former publication, have furnished the inducement to obtrude these on the public : it is hoped they will be received with the same candour and indulgence which has been before experienced.











## PLATE I.

GREY copper ore, composed of innumerable thin plates shot in various directions, of the pigeon-neck colour in the outer thin coat ; having at one end a very thin large crystal with six angles to the flat side of the former, and of a similar figure, though a little interrupted in the formation. From *Tincroft*.



## PLATE II.

Copper ore of an emerald-green colour, having crystals with four-sided pyramids, some of which are extended into parallelogramical forms, with groups of copper ore of the darkest blue or black colour, with spots of yellowish brown copper ore ; all cemented together by a mineral agent. From *Huel Providence*.



















## PLATE III.

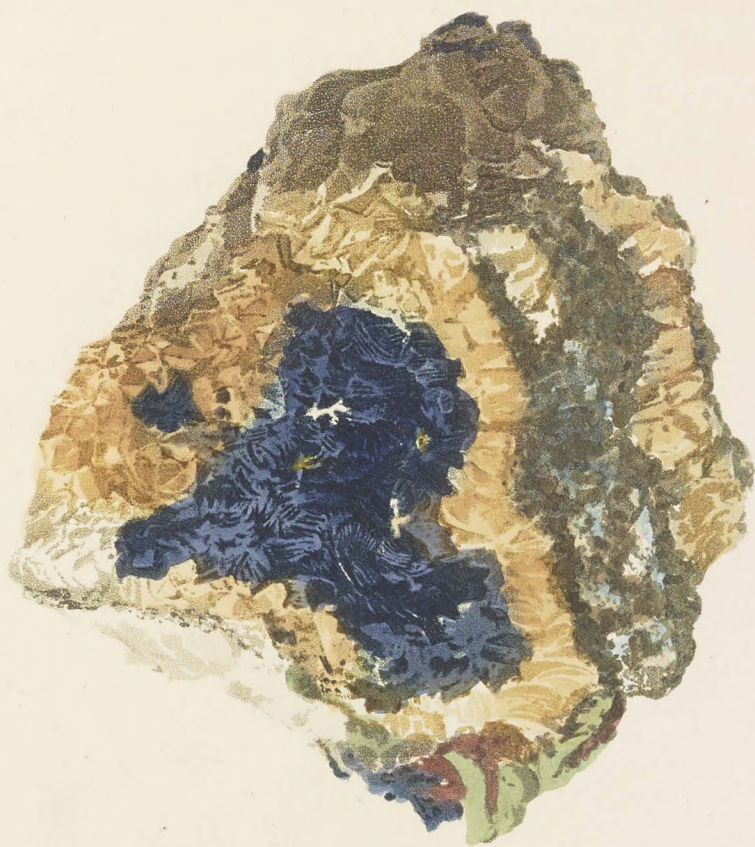
Dark blue copper ore, coated over with ore of a lighter blue colour, consisting of segments of circular crystals, composed of thin plates joined together by their sides, and the edges only appearing in groups of a circular shape, nearly covering the stone with their innumerable extraordinary forms, which are so blended together as to make the crystals rather indistinct. There are some crystals of copper ore of the darkest blue colour, approaching to black, as at *a*, and crystals of quartz, as at *b*, are to be seen cemented together by a mineral agent, which is probably iron. From *Huel Providence*.



## PLATE IV.

Crystals of copper ore of an indigo colour and spear-shaped form, as at *a*, which being joined together by the flat sides with the edges outward and points upwards, appear almost circular; this blue ore is surrounded with crystals like topazes, under which is copper ore of various colours, as green, blue, and grey. This stone seems part of a large nodule, with the blue ore in the centre, in which are a few flakes of a milk-white copper ore. From *Huel Providence*.

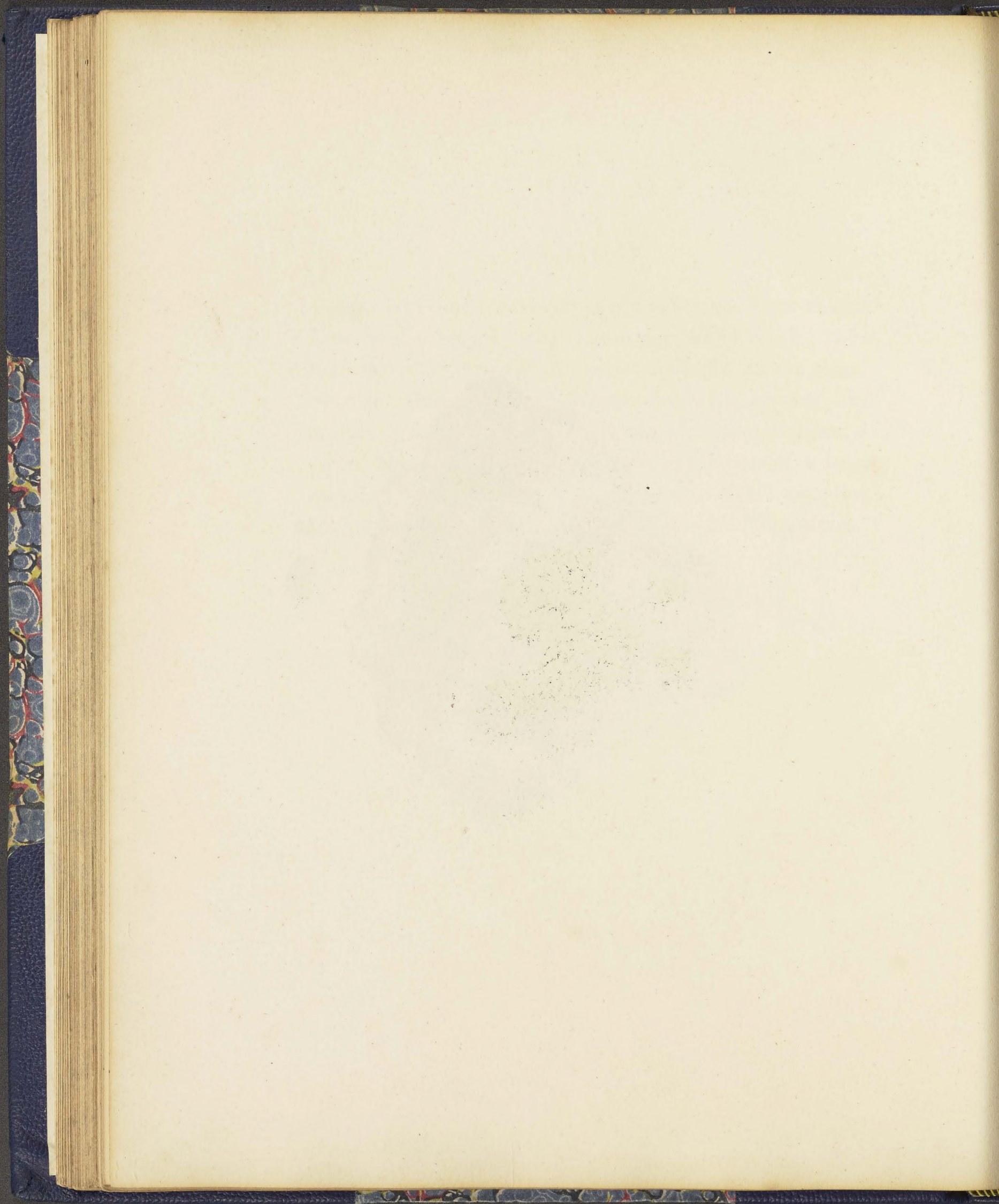




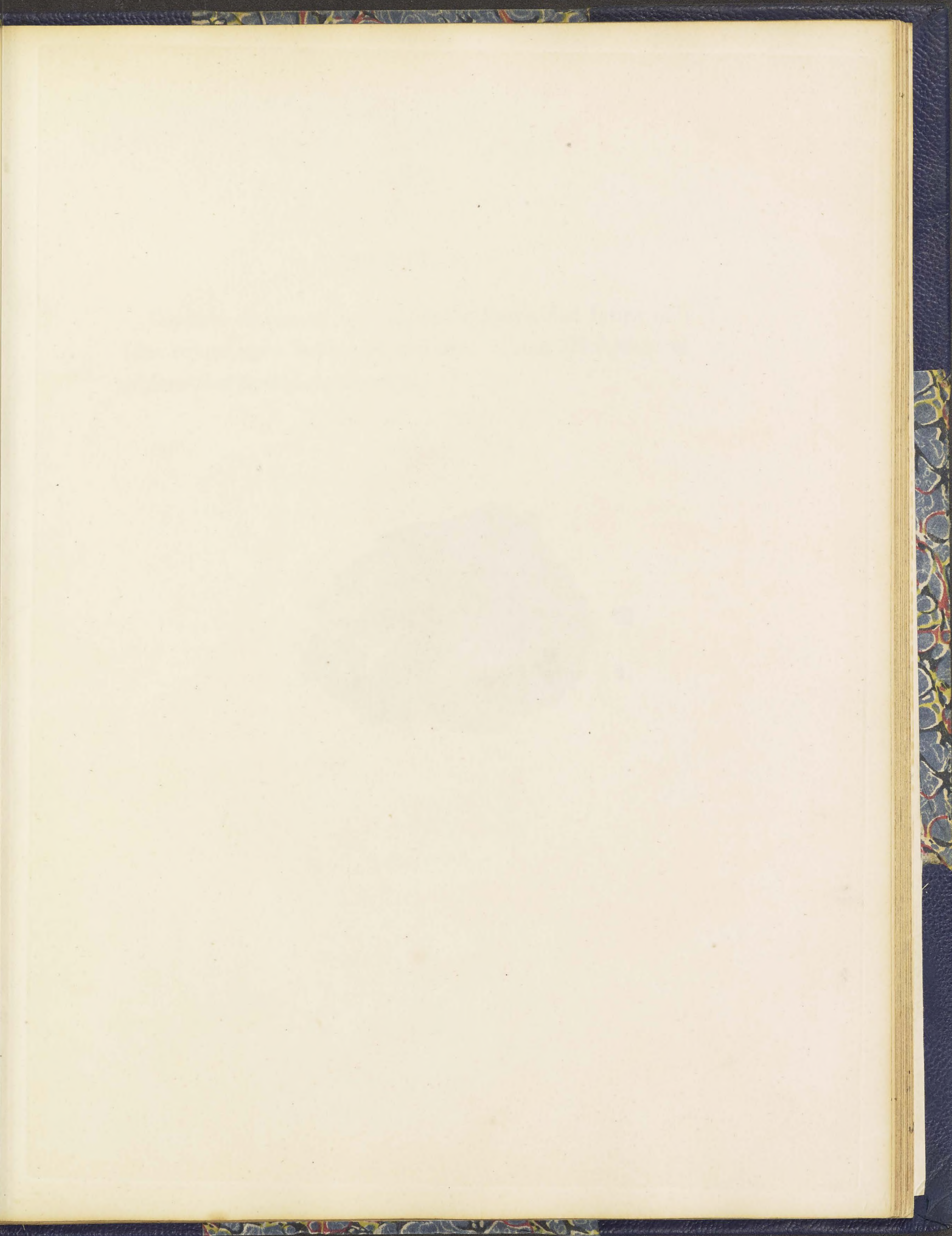
*Midland rock*

*Underneath the*

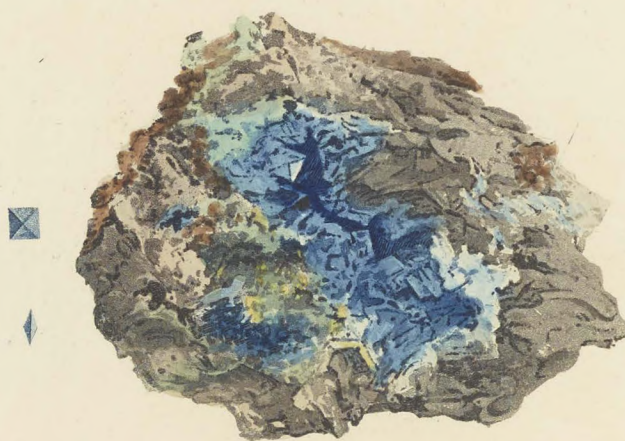












*Underwood. Ad.*

*Midland. Sculp.*



PLATE V.

Crystals of copper ore in double four-sided forms of a blue colour upon brown copper ore. From *Huel Mutterel*, or from that part of the Country.



## PLATE VI.

Very rich arseniate of copper ore of a deep green colour in the hollow part of the stone, where it is formed in circular figures ; on the edges round this hollow, the interior parts of the circles appear in striated forms, shooting from centres in rays to the outer circles, where the colour is of a much deeper green than at the centres : the stone is of a loose quartz cemented together by the ore of copper.



M.N



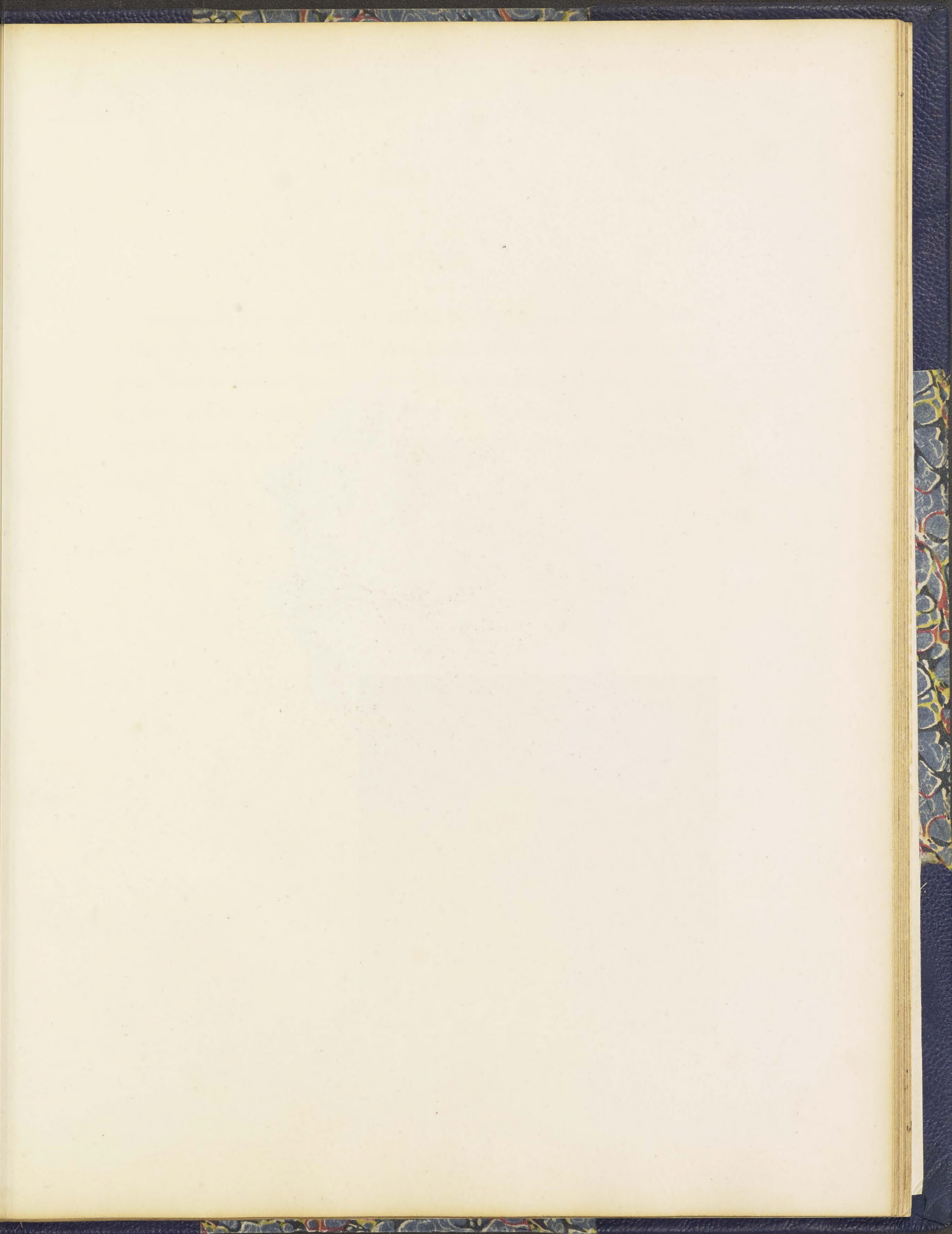
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*J. H. M. del.*















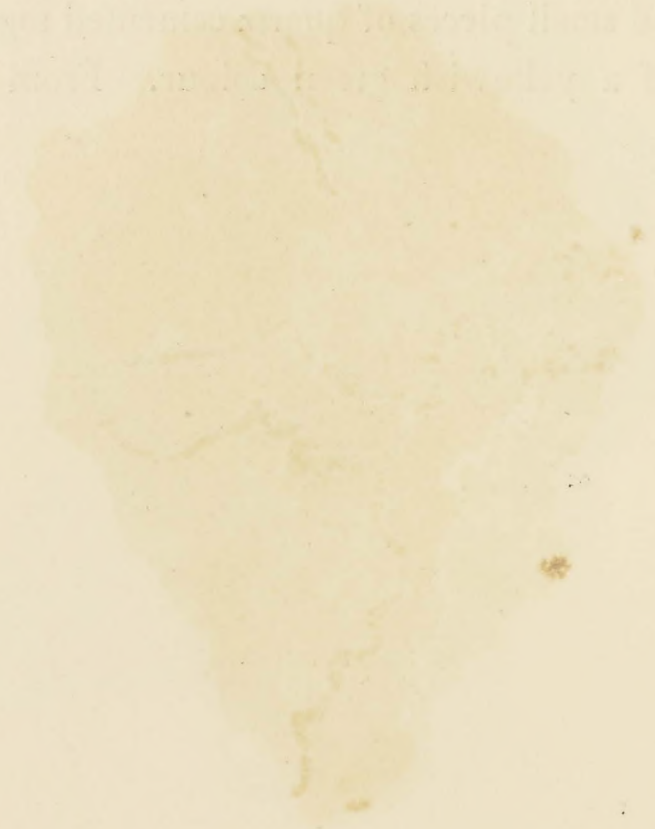
## PLATE VII.

Wood-like copper ore (so called by the miners) in curved lines of a brown colour, shaded much darker at the exterior part than towards the centres, with some hair copper ore of a green colour, and small pieces of quartz cemented together by copper ore of a yellowish green colour. From *Huel Unity*.



PLATE VIII.

Brick or tile copper ore in granite. From *Huel Mutterel*.





Nº 8

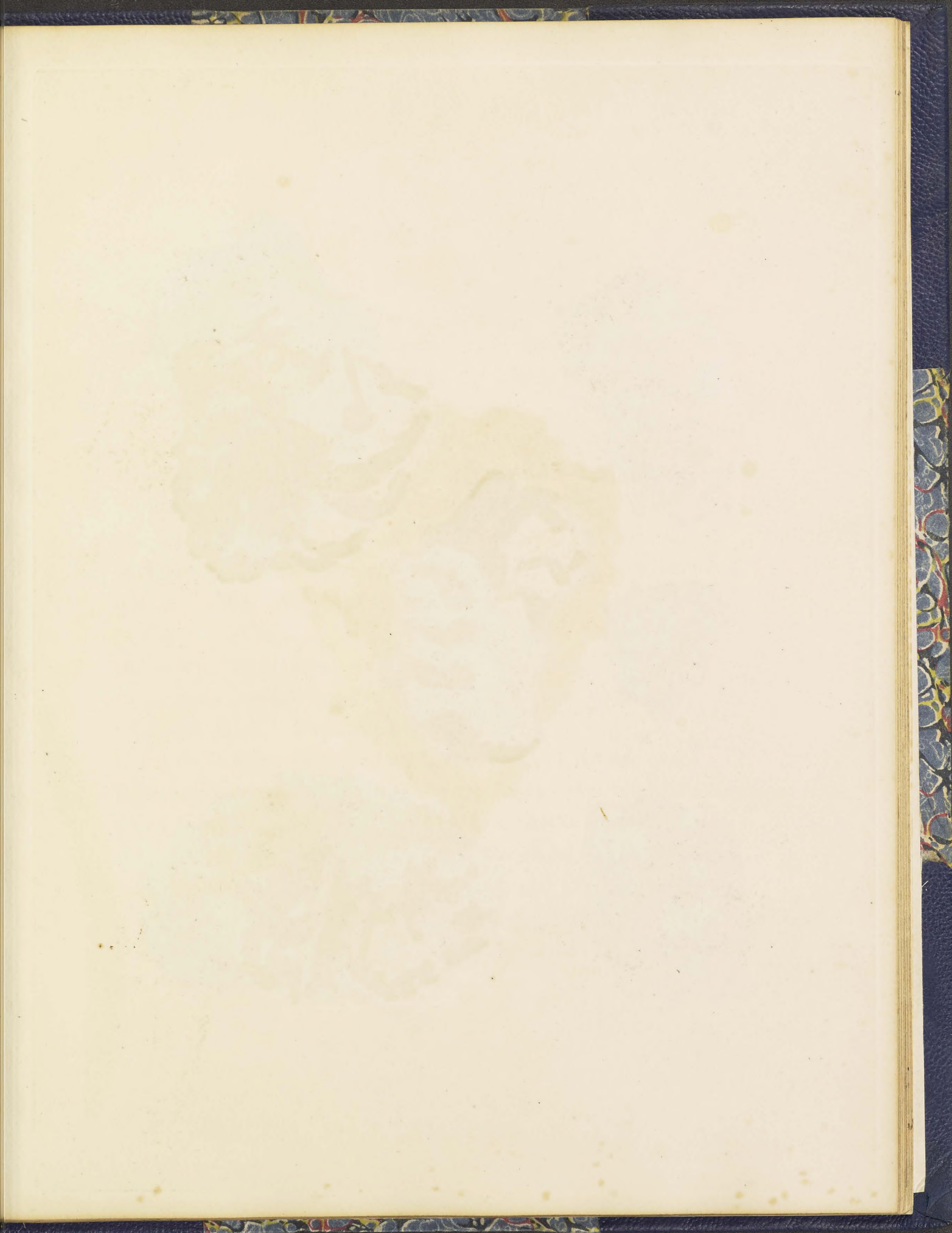


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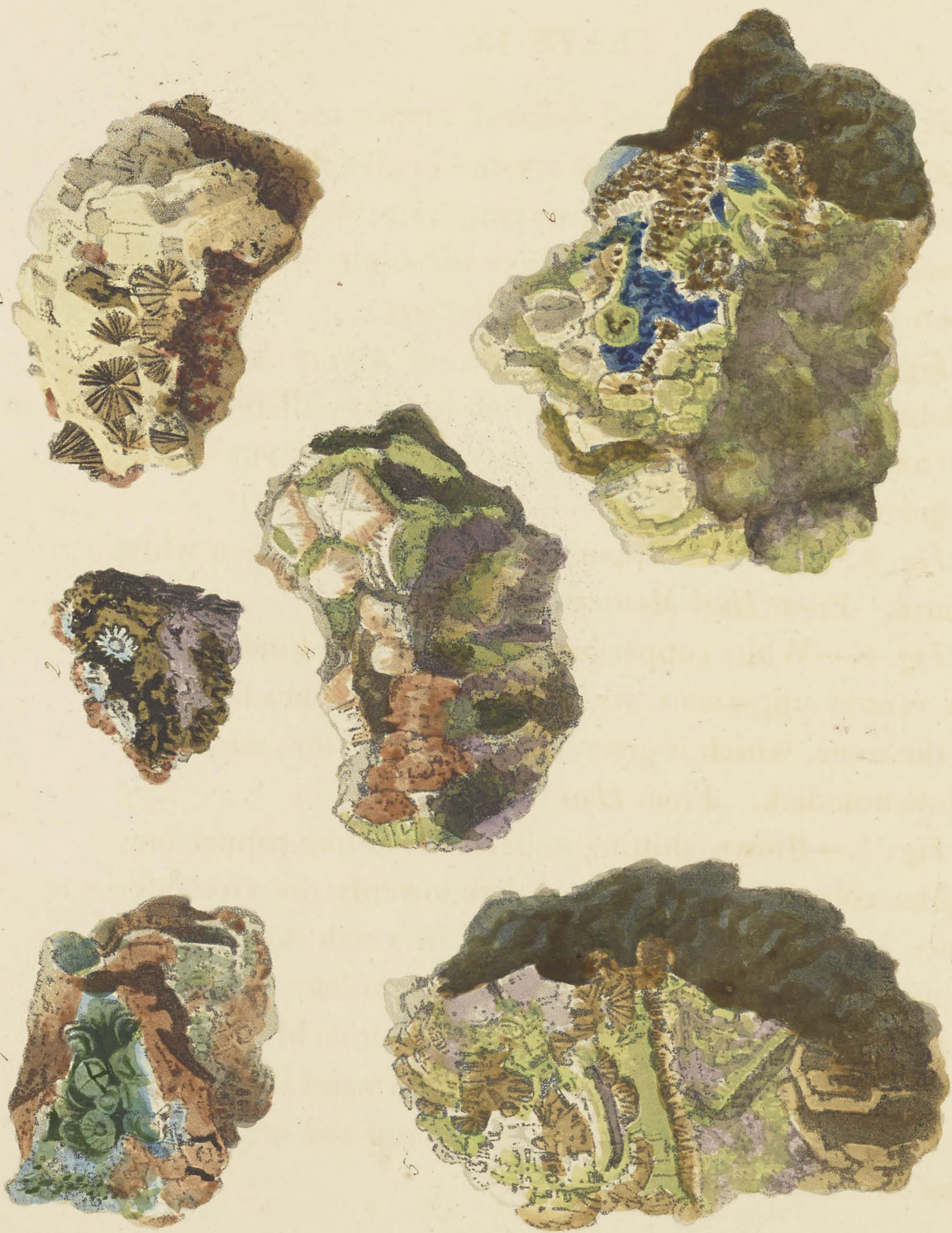














## PLATE IX.

*Fig. 1.*—Stalactical and stellated copper ore of a grass-green colour, with some blue crystals in globular forms, and others having a globule in the centre of a blue colour, surrounded with rays diverging from the centre to the circle upon Gossany ore. From *Huel Mutterel*.

*Fig. 2.*—Crystals of copper ore, of a very light blue colour in the centre, one of which has rays all round the circumference, with yellowish green crystals upon a stone of quartz.

*Fig. 3.*—Stellated copper ore of a brown colour in white quartz. From *Huel Mutterel*.

*Fig. 4.*—White copper ore of the stellated kind, having the centres uppermost, with rays diverging into the body of the stone, which is green and red copper ore, with some white mundick. From *Huel Gorland*.

*Fig. 5.*—Brown shining stellated wood-like copper ore, lighter coloured in the centre than towards the circumference, between green malachite ore, in a rich stone of grey copper ore with quartz. From *Huel Providence*.

*Fig. 6.*—Stellated copper ore diverging from black centres in small white rays, surrounded with green and blue copper ore, in a stone of white, blue, green, and red ore. From *Huel Mutterel*.



## PLATE X.

*Fig. 1.*—Copper ore of a celestial blue colour, in small plated six-sided crystals, as at *a*, mixed with small stalactical copper ore of a verdigrise colour, upon red copper ore. From *Huel Gorland*.

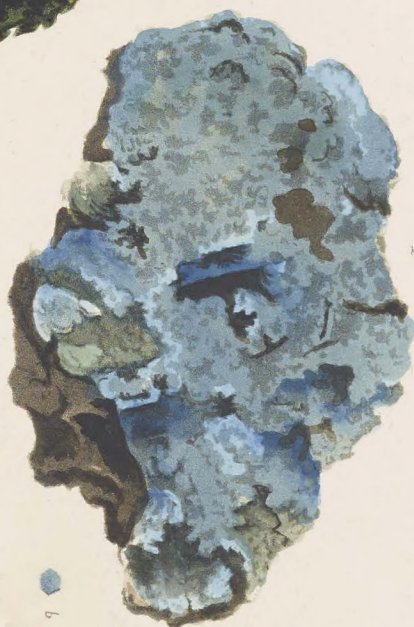
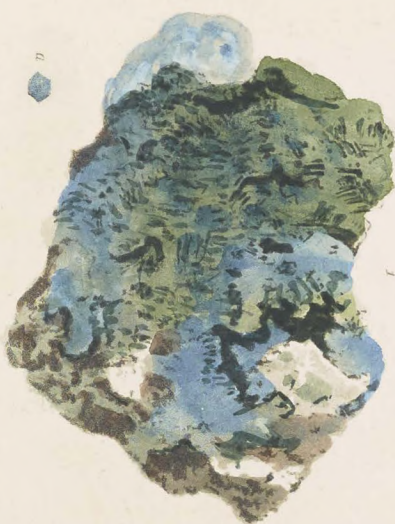
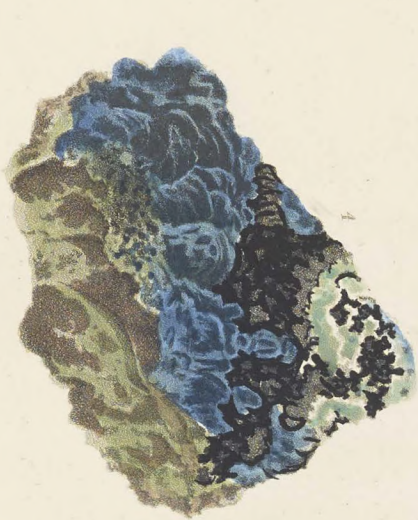
*Fig. 2.*—Copper ore of a greenish blue colour with six-sided plated crystals, as at *b*.

*Fig. 3.* Copper ore of a deep green colour in double four-sided plates, with some white copper ore upon the green crystals, as at *c* and *d*. From *Huel Unity*.

*Fig. 4.*—Copper ore of a blue colour and scaly texture, with copper ore of the deepest blue colour, nearly black, in globular forms, upon red copper ore. From *Huel Gorland*.

*Fig. 5.*—The lightest coloured grey copper ore, or what is generally called white copper ore, upon which are transparent crystals of a very pale smalt blue colour, with four-sided prisms, and four-sided pyramid ends. From *Huel Unity*.





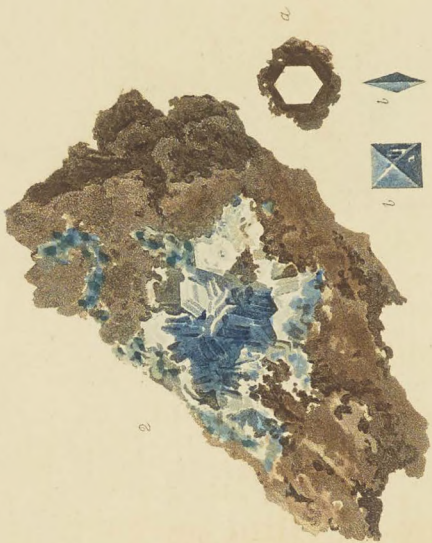




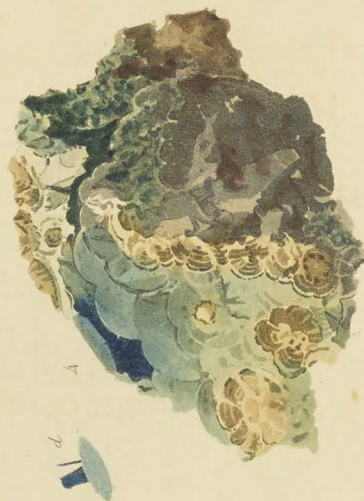








*J. M. Wood*



*J. M. Wood*



## PLATE XI.

*Fig. 1.*—Two oval forms of arseniate of copper ore of a buff colour, one flat, the other projecting, both smooth in the middle, then bursting into open rays, round which is a smooth line, then open rays, all rich copper ore. From *Huel Mutterel*.

*Fig. 2.*—Copper ore of a milk-white colour, in thin six-sided plated crystals, represented at *a*, and double four-sided pyramids of copper ore of a sky-blue colour, as at *b*, upon copper ore of a brown colour ; almost a singular specimen. From *Huel Gorland*.

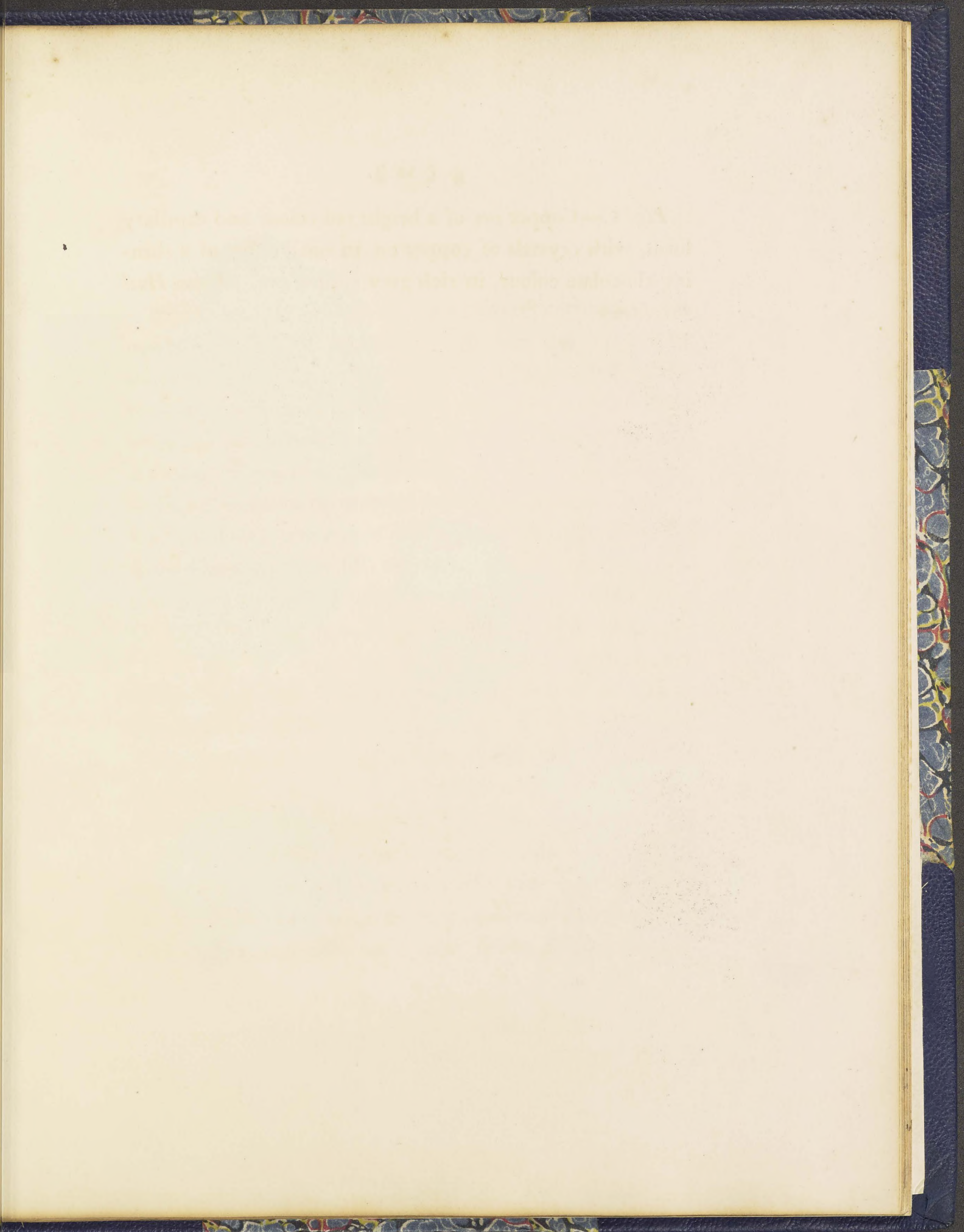
*Fig. 3.*—Copper ore of a sky-blue colour, with double four-sided pyramids, lengthened into parallelograms, as at *c*, a little transparent, and very perfect in their forms, intermixed with copper ore of a grass-green colour and wire-like shape, quite opake ; all upon brick or tile ore. From *Huel Mutterel*.

*Fig. 4.*—Stellated or wood-like copper ore of a light brown colour, with copper ore of a pale blue colour in globular forms like malachite ore, on which are small crystals, with truncated ends, as at *d*, of a dark green colour in a stone of brown copper ore. From *Huel Gorland*.



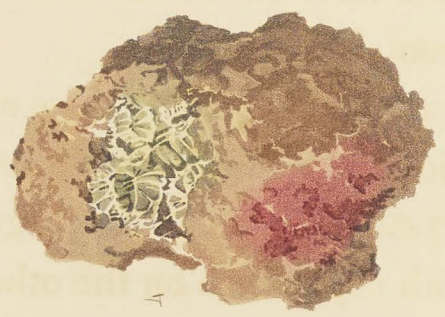
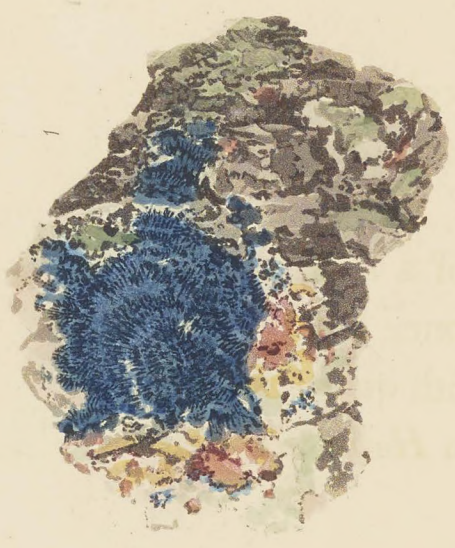
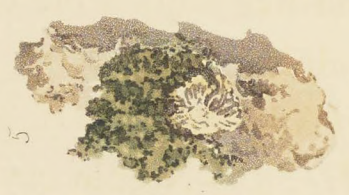
*Fig. 5.*—Copper ore of a bright red colour and capillary form, with crystals of copper ore in small cubes of a shining chocolate colour, in rich grey copper ore. From *Huel Providence*.







Midland Sculp.



Underwood del. t.



## PLATE XII.

*Fig. 1.*—Copper ore of an azure blue colour composed of needle crystals, exhibiting a circular form on the top, by uniting together on a stone rich in copper ore of various colours, intermixed with quartz. This ore has not been analyzed, but is supposed to contain some iron in the blue crystals. From *Huel Providence*.

*Fig. 2.*—Arseniate needle crystals of copper ore of a white colour, intermixed with green copper ore; also wood-like copper ore of a brown colour, and copper ore of a sulphur yellow, or pale greenish colour. From *Huel Gorland*.

*Fig. 3.*—Needle crystals of copper ore of a grass-green colour, with some blue copper ore in a kind of gossan. From *Huel Mutterel*.

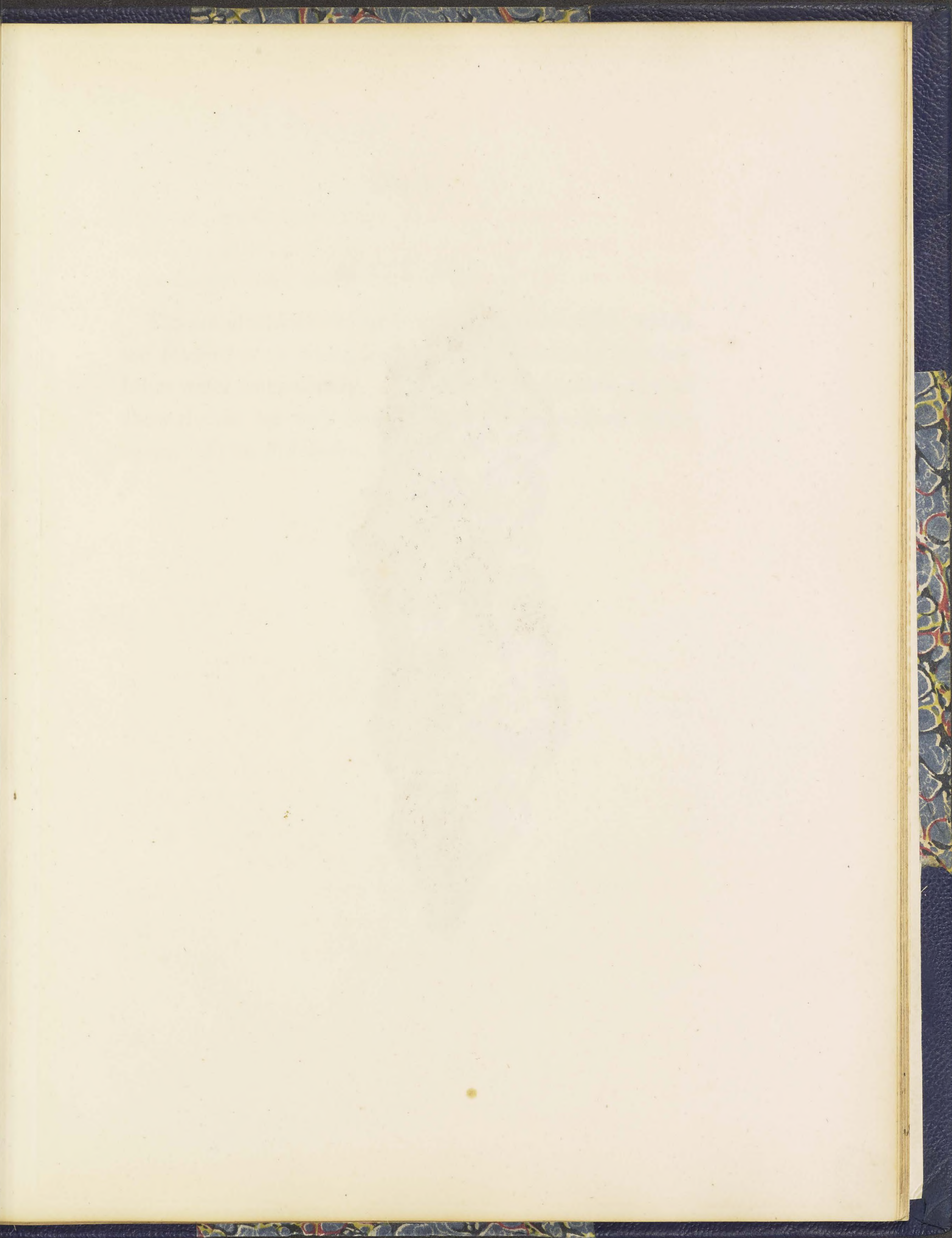
*Fig. 4.*—Copper ore of a satin-white colour and undulated form in a rich stone of various coloured copper ore. From *Huel Gorland*.

*Fig. 5.*—A small piece of copper ore of a stellated form and white colour, in the middle of a stone, having small crystals of copper ore of a green colour, with quartz, spotted with copper ore on the other side. From *Huel Gorland*.



*Fig. 6.*—Copper ore of a smalt blue colour in small needle crystals, supposed to contain iron, with dark blue and tile ore, in a stone of quartz. From *Huel Providence*.









Unlabeled 44

Unlabeled 44



PLATE XIII.

Tin ore of a black colour in crystals of four sides, which are covered with white hydrophanous calcedony that imbibes water immediately, and becomes transparent, so as to shew the tin ore very distinctly, and soon becomes opaque again. From *Pednandra*.



## PLATE XIV.

*Fig. 1.*—Wood-like tin ore, of a brown colour, encircling the external sides of opaque crystals of quartz, visible on the top and edges of the stone, which consists of a solid mass of white quartz. From a Stream in *Sithney*.

*Fig. 2.*—Exhibits the edge of *fig. 1*. Both specimens prove that the tin ore and the quartz must have been once in a fluid state, though now consolidated; they likewise shew, that three distinct and separate crystallizations must have taken place in the formation of this stone. First, that of the crystals of quartz, then, that of the tin ore, and last, that of the general mass of quartz.

*Fig. 3.*—Wood-like tin ore in singular forms, of a black colour, spreading over a red substance, which is said to be tin ore, though of an unusual colour. Some of the other black parts of the stone are likewise tin ore; the white parts are quartz; the upper part of the stone, which is of a light brown colour, is a fine granulated substance, not very hard, but very heavy. From *St. Enedor*.

*Fig. 4.*—A crystal of quartz covered with wood-like tin ore, and exhibiting the pyramidal part of the quartz a perfect six-sided figure. From *Sithney*.





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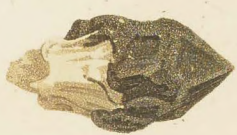


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*Medieval style*

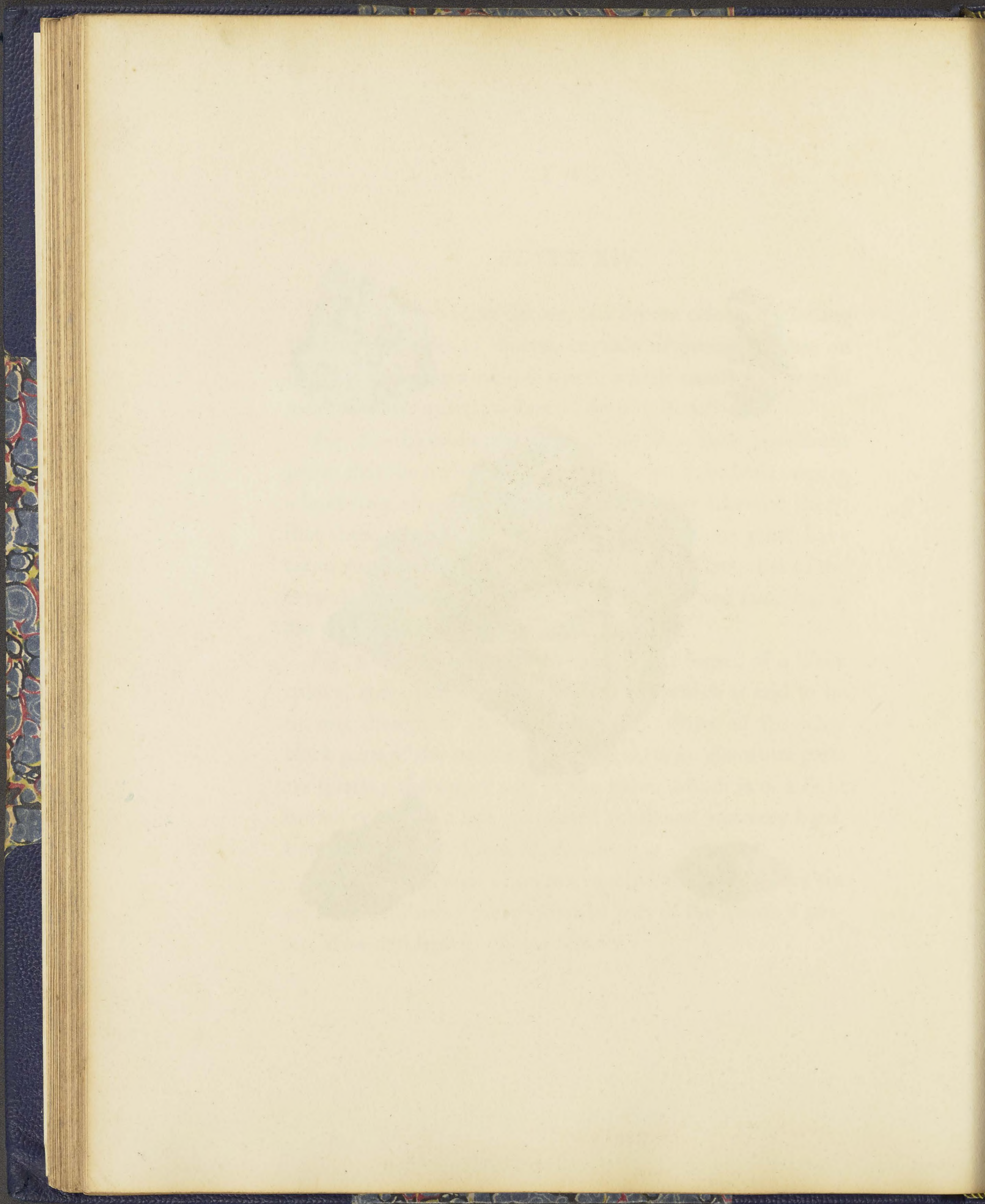


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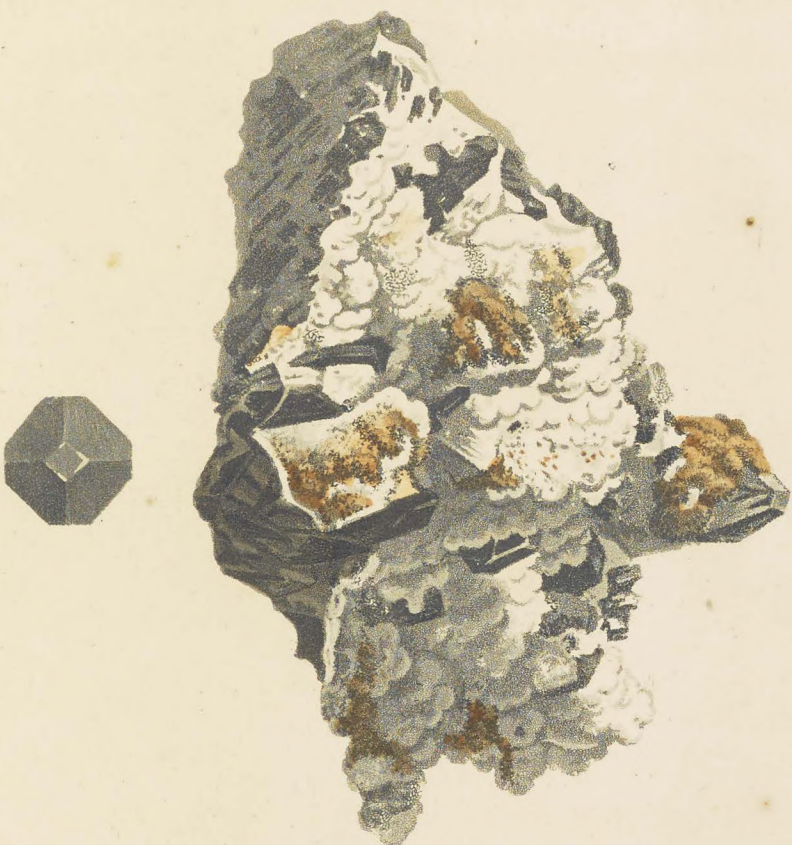
*Fig. 5.*—Striated wood-like tin ore, of a reddish brown colour, divided by belts or lines of common black tin ore, which likewise appear at the top and bottom of the specimen, with a thin line of the same in the middle.



## PLATE XV.

Galena, with 24-sided crystals, having all the angles truncated; on them is seen the purest calcareous spar, of a most beautiful white colour, upon which an ochry substance has been deposited, of a deep yellow colour. From *Derbyshire*.

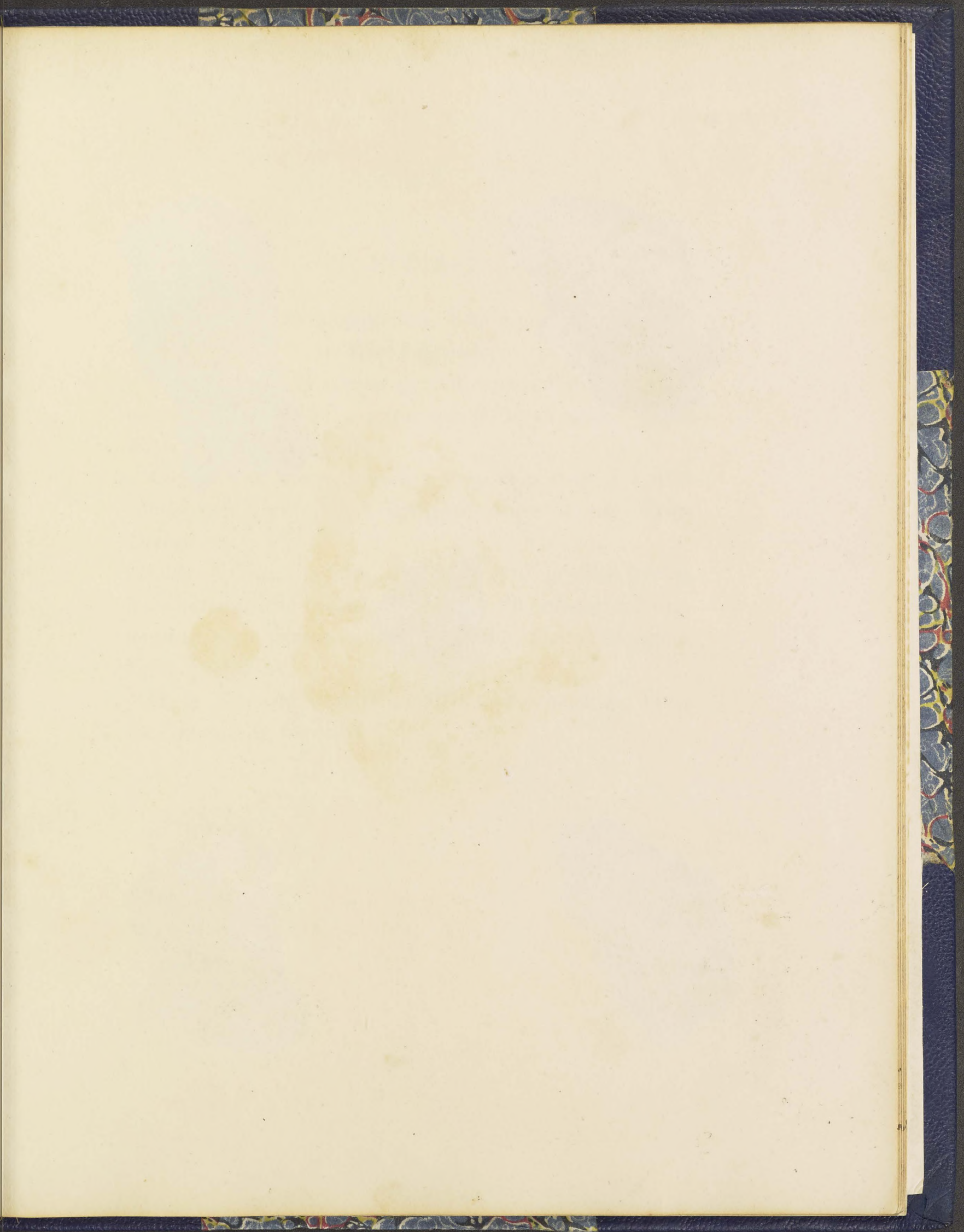




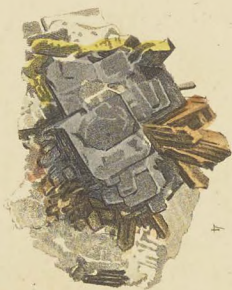












*Mineral. 417*

*Mineral. 418*



PLATE XVI.

1 Lead ore, of six-sided prisms, with truncated ends, of a yellow colour. From *Huel Edgcumbe*.

2 Small crystals of copper pyrites, upon calcareous dog's-tooth spar, tinged of a green colour, upon cauk. From *Ecton Mine*, in *Derbyshire*.

3 Copper ore, covered with a very thin coat of a blue colour, and pyrites of a tarnished silver colour. From *Derbyshire*.

4 Cubic galena, in form of a cross, with pyrites issuing from between the crystals of lead ore, in columnar forms, terminating in pyramids, having two sides ending in points. From *Derbyshire*.

5 Horn-silver ore, in small cubes, of a brown colour. From *Huel Mexico*, in *Cornwall*.



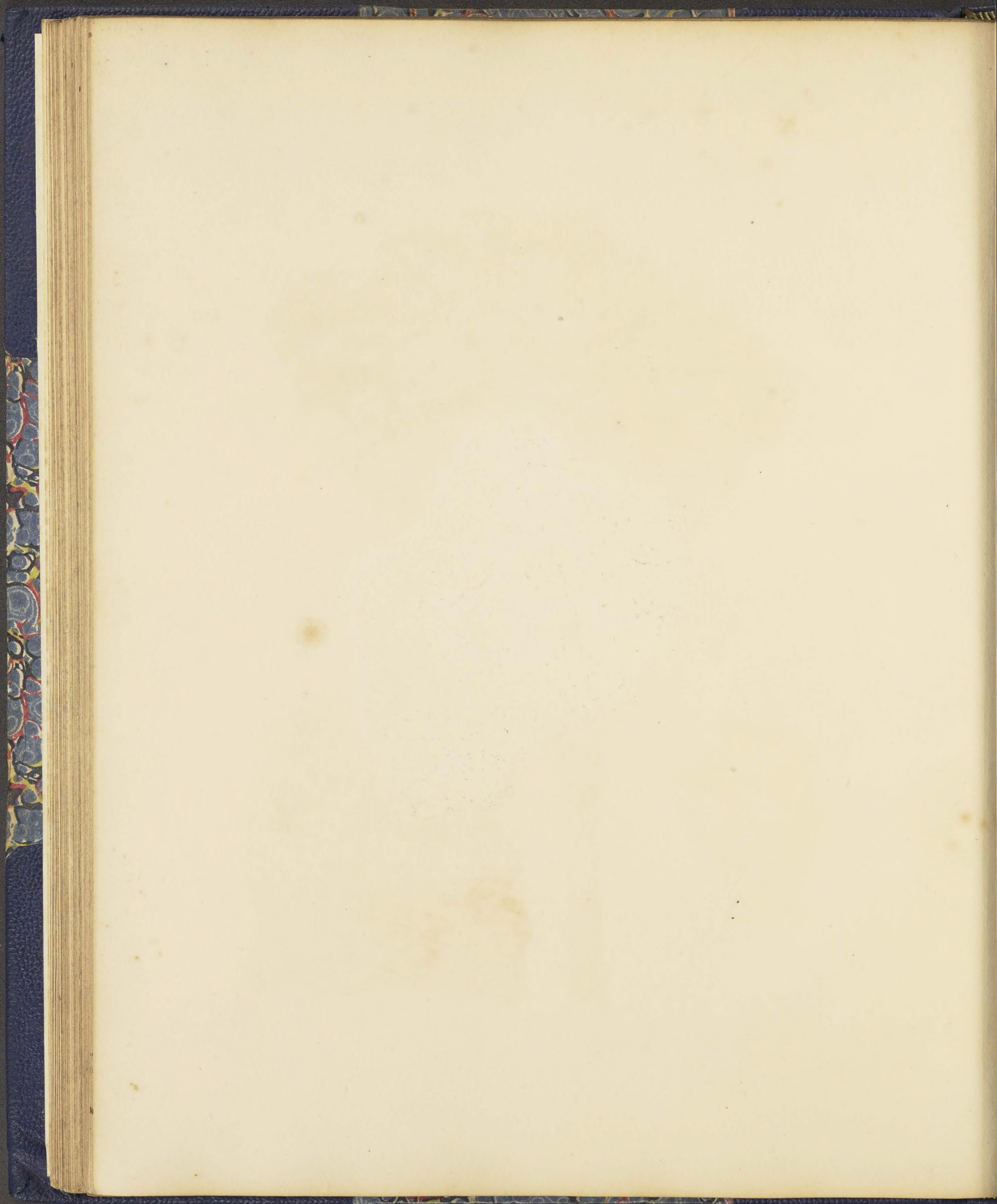
## PLATE XVII.

Iron ore, in a variety of irregular circular forms, with thin lines of black and ochry colour appearing alternately; where the surface is unbroken it is bulbous. From a Stream Work in *St. Stephen's*, in *Brannel*.











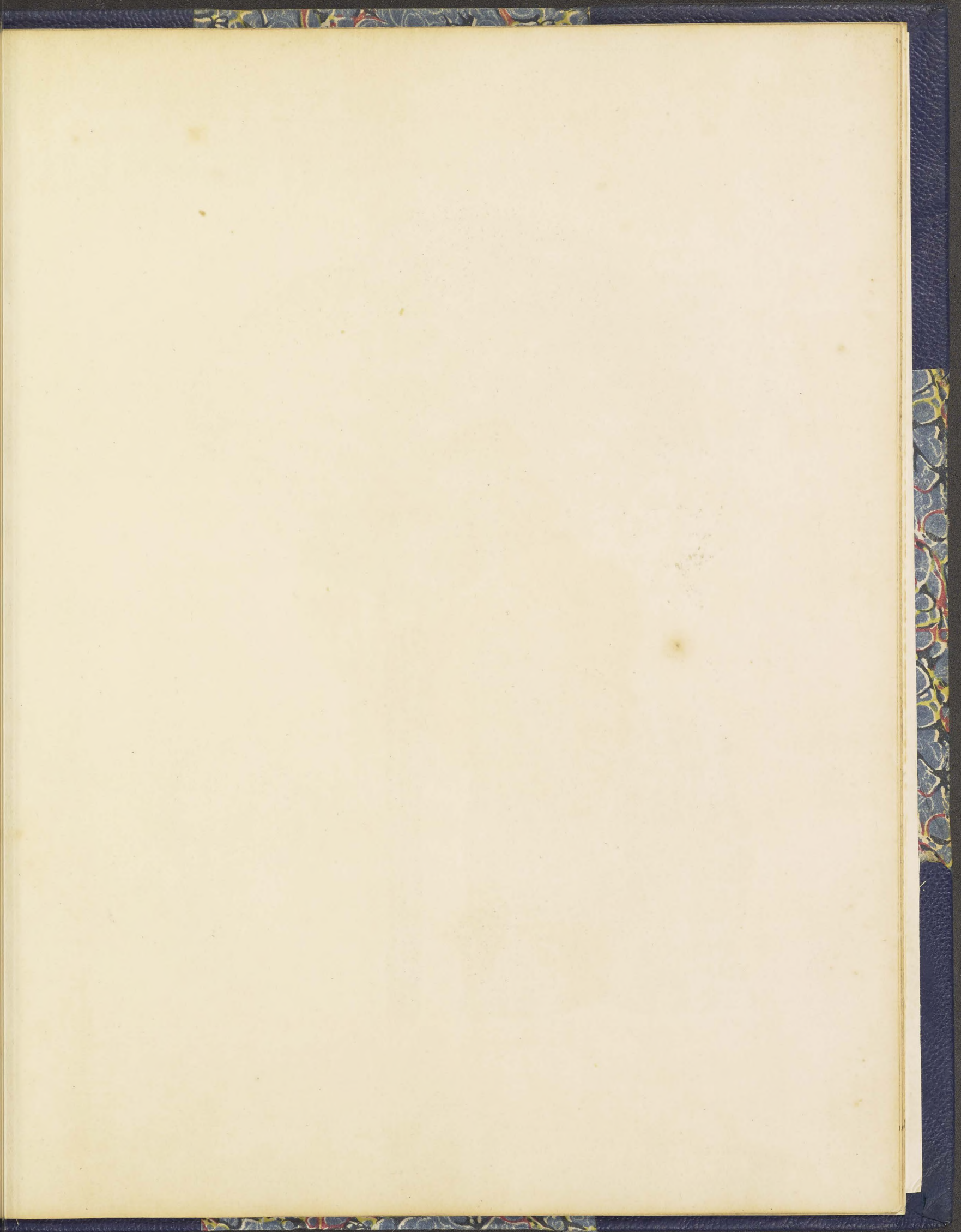








PLATE XVIII.

*Fig. 1.*—Serpentine stone, in irregular four-sided figures, divided by white lines at nearly right angles on the surface on each side the stone, which is of a greenish colour.

*Fig. 2.*—The edge of the same stone of a red colour, divided by two lines of white asbestos. From near the *Lizard*.

*Fig. 3.*—Serpentine stone, of a yellowish-green colour, having veins in all directions, of a red colour, in and over the whole stone. From the *Lizard*.

*Fig. 4.*—A sort of steatites or soap-stone, in waved striæ of various colours. From *Stowes-end Mine*, in *Linkinghorne*.

This substance, it is supposed, has never been analyzed.



## PLATE XIX.

A fossil mamillary echinus, with a flint filling the shell, and running through it, being both unbroken, proving the latter to have been in a liquid state at the time of filling the shell, and not to have been produced by fire, as the shell in such a case would have been converted into lime: a clear evidence of the Neptunian system prevailing over the volcanic, in this instance. From *North Fleet*.

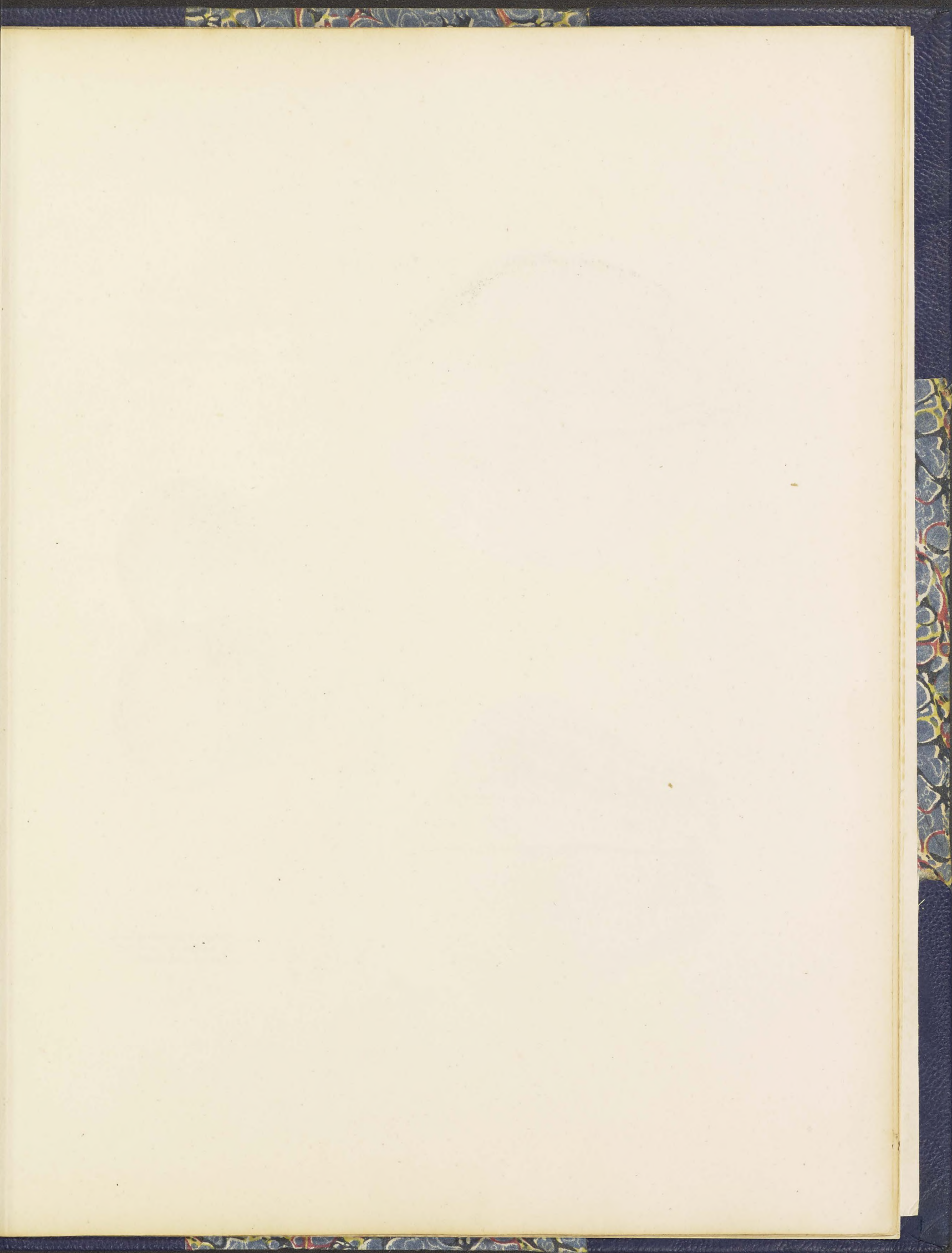














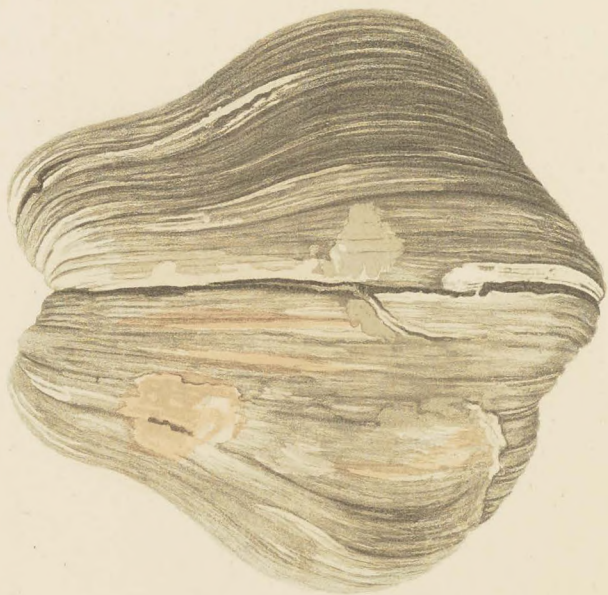




PLATE XX.

Three figures of a bivalve fossil, exhibiting the upper and under side, with the hinge end. From *Colebrook Dale*.

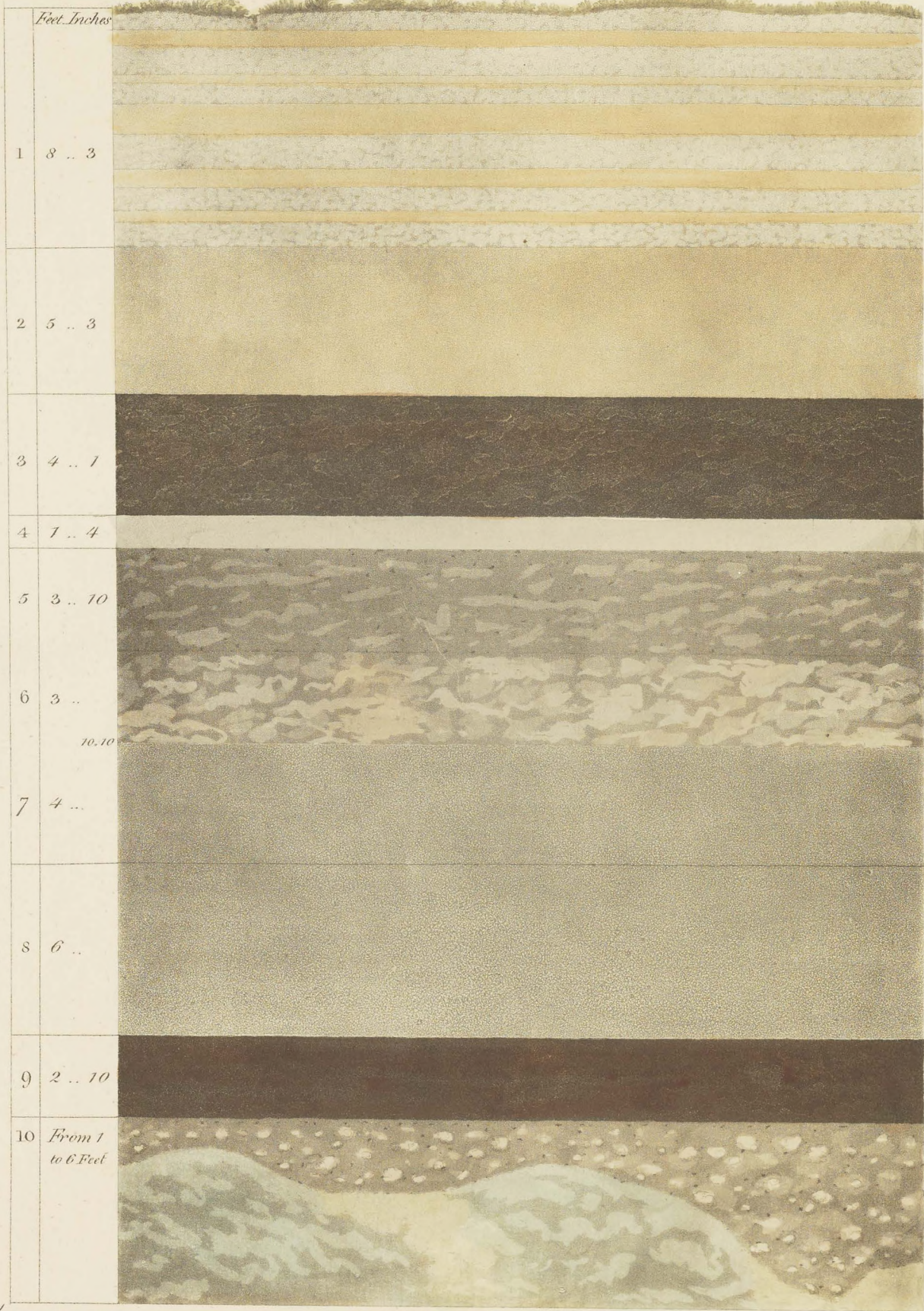












Total 44..7



SECTION of the STREAM WORK, at POTH, in the Parish of ST. BLAZEY, about  
a Quarter of a Mile from High Water Mark.

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1. The surface is grass and other vegetables; about two inches under which is found micaceous sand, mixed with a little earth, of a light colour, in strata of various shades and thickness, according to the quantity of matter driven down by successive floods ;the whole being 8 feet 3 inches deep.
  2. The next stratum is a bed of light dove-coloured earth, with less mica than the bed above it; 5 feet 3 inches thick.
  3. Peat, that burns pretty well; 4 feet 1 inch.
  4. Clay of an ash colour, that adheres strongly to the tongue, mixed with vegetable substances; 1 ft 4 in.
  5. Fine earth, with small blue spots and decayed vegetables; 3 feet 10 inches.
  6. Very fine sand; 3 feet.
  7. Coarser sand; 4 feet.
  8. Larger sand; 6 feet.
  9. Very black fen, with small decayed vegetables, giving a disagreeable smell when on fire, and contains some bituminous matter; 2 feet 10 inches.
  10. Tin ground, with which the ore is found in various thickness, from 1 to 6 feet, upon very light-coloured fragments of slate and yellow clay, on which the tin ore lodges in particles of various sizes, from the most minute to stones of some pounds in weight. Various sorts of tin ore are found in this work, which have been brought down by floods from different lodes in the high ground at considerable distances.
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*An extraordinary high tide destroyed this Work entirely in the winter of 1801.*



















